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Cooperative
**ECONOMIC INSECT
REPORT**

Issued by

PLANT PEST CONTROL DIVISION

AGRICULTURAL RESEARCH SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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**Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
Federal Center Building
Hyattsville, Maryland 20782**

COOPERATIVE ECONOMIC INSECT REPORT**HIGHLIGHTS**Current Conditions

ARMY CUTWORM damaged sugarbeets in Idaho; flights heavy across Nebraska; BEET LEAFHOPPER heavy in sugarbeets in Pinal County, Arizona; POTATO LEAFHOPPER heavier than normal in Illinois. (p. 541).

EUROPEAN CORN BORER egg masses in most States reporting; young larvae in some areas. (p. 542). SORGHUM MIDGE damaging in Rio Grande Valley and other areas of Texas; ENGLISH GRAIN APHID increasing in northern and central Indiana. (p. 543).

Heavy FALSE CHINCH BUG migration in Lubbock and Floyd Counties, Texas. (p. 544).

ALFALFA WEEVIL reported for first time in Oklahoma; heavier than usual in western Nevada; increasing in some States. (p. 545).

PEA APHID increased on alfalfa in Michigan; significant in Wyoming and Colorado. (p. 546).

BOLL WEEVIL heavy in central and southern Alabama. BOLLWORM flights increased sharply in same State. (p. 548). COTTON FLEAHOPPER increased in areas of New Mexico and Texas. (p. 549).

COLORADO POTATO BEETLE becoming troublesome in central and southern New Jersey. (p. 550).

Peak flights of RED-BANDED LEAF ROLLER and LESSER PEACH TREE BORER in progress in Indiana. (p. 552).

MOUNTAIN PINE BEETLE infested 1,000 acres of pine in Trinity-Shasta National Forest of California. (p. 556).

HORN FLY increasing throughout Oklahoma and in northwest Arkansas. (p. 559). LONE STAR TICK heavy in eastern Oklahoma. (p. 560).

CEREAL LEAF BEETLE heavy in Jackson and Allegan Counties, Michigan. (p. 561).

Detection

ALFALFA WEEVIL reported for first time in Oklahoma. (p. 545).

For new county records see page 558.

Special Reports

● Survey Methods. Selected References for First Half of 1967. Part VIII. (pp. 564-568).

● European corn borer loss in 1967 much lower than in 1966. (pp. 569-570).

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SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

ARMY CUTWORM (*Chorizagrotis auxiliaris*) - IDAHO - Second and third instars infested seedling clover in Bonner County. (McPherson). Mainly fifth instars severely damaged sugarbeets June 5 at Rupert, Minidoka County. (Smith). WYOMING - Adults appearing in Goshen and Laramie Counties. (Parshall). NEBRASKA - Flights generally heavy across State. (Keith).

ARMYWORM (*Pseudaletia unipuncta*) - NEW JERSEY - Taken in several Salem and Cumberland County barley fields. (Ins.-Dis. Newsltr.). MARYLAND - Larvae 1-3 per square yard in lodged wheat and barley in Queen Annes and Talbot Counties. (U. Md., Ent. Dept., June 7). INDIANA - Larvae very light; mostly early instars as of June 12. (Huber, Porter). MICHIGAN - Activity reduced sharply. Egg laying on some crops; young larvae through first instar in many Calhoun and Kalamazoo County wheatfields. (Newman, June 10). ILLINOIS - Still found in south-central and southern area wheat. Feeding on grass in hay mixtures; occasional migration in adjoining corn stands. Full-grown larvae pupating and being rapidly killed by disease and parasites. (Ins. Sur. Bull.).

ASTER LEAFHOPPER (*Macrosteles fascifrons*) - MICHIGAN - Increased greatly June 7-9. (Bath). NORTH DAKOTA - Light; highest count 20 per 100 sweeps on barley in Cass County. (Brandvik).

BEEF LEAFHOPPER (*Circulifer tenellus*) - ARIZONA - Heavy, 1,200 per 100 sweeps, in many sugarbeet fields at Casa Grande, Pinal County. (Ariz. Coop. Sur.). COLORADO - Ranged 0-0.6 per plant and averaged 0.4 per square foot of row in thinned sugarbeets in Mesa County. Sugarbeets in 8 to 12-leaf stage. (Bulla).

CORN EARWORM (*Heliothis zea*) - ARKANSAS - Second instars ranged 50-60 per 100 sweeps in alfalfa field in northwest area. (Boyer).

CORN LEAF APHID (*Rhopalosiphum maidis*) - ARIZONA - Averaged 20 per plant in 40-acre milo field at Kansas Settlement, Cochise County. (Ariz. Coop. Sur.).

PAINTED LADY (*Vanessa cardui*) - TENNESSEE - Damaged sunflower field in western area. (Russell, Bennett). INDIANA - Larvae moderate to heavy, 2-8 per plant, on 50 percent of thistle plants throughout northern half of State since mid-May. Migrating from defoliated thistles onto soybeans, grasses, and small grains throughout central and northern areas. Damage mostly restricted to small areas within fields; some damage in large pasture areas and in up to 6 acres of soybeans. (Huber et al.). ILLINOIS - Damaged soybeans in eastern and northeastern sections. (Ill. Ins. Rpt.). WISCONSIN - Prevalent on Canada and bull-thistle throughout southern area. (Wis. Ins. Sur.). MINNESOTA - Early to nearly full-grown larvae feeding on Canada thistle in Redwood, Yellow Medicine, Fillmore, Mower, Olmsted, Martin, Pipestone, and Jackson Counties; feeding begun on soybeans. (Minn. Ins. Rpt.). IOWA - Larvae infested soybeans and some corn; damage reported nearly statewide. (Iowa Ins. Sur.). SOUTH DAKOTA - Larvae numerous on thistle in eastern area; some damage in soybean fields. (Jones). NEBRASKA - Damaged soybeans in Wayne County. (Woods, June 7). WYOMING - Larvae abundant on Canada thistle in Laramie and Goshen Counties. (Parshall). COLORADO - Larvae abundant on Canada thistle in northeastern area. (Hantsbarger).

POTATO LEAFHOPPER (*Empoasca fabae*) - MARYLAND - Adults 2-5 per 10 sweeps in 10 acres of alfalfa near Price, Queen Annes County. (U. Md., Ent. Dept., June 7). INDIANA - Adults ranged 3-17 per sweep on 4 to 14-inch second-growth alfalfa in northern and central districts; damage potential to second-growth alfalfa very high. (Huber). ILLINOIS - Continues heavier than normal. (Ins. Sur. Bull.). WISCONSIN - Adults common in commercial potato field in Spring Green area. Large flight prior to June 6. (Wis. Ins. Sur.). MINNESOTA - Averaged 200 per 100 sweeps in southern southeast district due to recent migrations from southern States. Ranged 0-5 per 100 sweeps in southwest, central, and east-central districts. (Minn. Ins. Rpt.). NEBRASKA - Scattered and light, 0-9 (average 4) per 100 sweeps, in 12 alfalfa fields in Dawson County. (Manglitz).

POTATO PSYLLID (Paratrioza cockerelli) - COLORADO - Unchanged at Fort Lupton, Platteville, and Gilcrest area, Weld County. Adults 0-20 per 100 sweeps and eggs 0-5 per leaf. Adults per 100 sweeps: 100 on Lycium and 0-20 on potatoes at Gilcrest; no nymphs on Lycium or potatoes. (Johnson, Urano). WYOMING - Adults 2 per 100 sweeps on matrimony-vine in Torrington, Goshen County; none found in potatoes. (Parshall).

SPOTTED ALFALFA APHID (Therioaphis maculata) - ARKANSAS - Survey continues negative. Aphids likely to appear with decreased rainfall. (Boyer). KANSAS - Surveys negative in Jackson, Pottawatomie, Doniphan, Brown, and Nemaha Counties. (Simpson). NEBRASKA - Very light, 0-30 (average 7) per 100 sweeps, in 12 alfalfa fields in Dawson County. (Manglitz). SOUTH DAKOTA - Light, 10 per 100 sweeps, on northern Minnehaha County alfalfa. (Jones).

TOBACCO HORNWORM (Manduca sexta) - TENNESSEE - Few early instars on Maury County tobacco. (Pless).

CORN, SORGHUM, SUGARCANE

EUROPEAN CORN BORER (Ostrinia nubilalis) - NEW HAMPSHIRE - Adults in hedgerows bordering cornfields at Litchfield June 6; no egg hatch to date. (Sutherland). RHODE ISLAND - Larvae in Providence County June 6. (King). NEW YORK - Emergence from caged stalk pieces, acquired in fall and spring, three-fourths complete June 10. Moth trap catches ranged up to 6 per night; mostly females. Egg masses 20+ on 100 plants near moth-infested hedgerow at New Paltz; very high by June 7. Lighter in few areas; still above normal. Egg mass collected June 4 at Hurley hatched June 7. "Black head" masses common June 7. Egg masses 3 per 50 plants in one field and 4 per 50 plants in another field of early sweet corn June 6 on Hudson River flats, Rensselaer County. Corn leaf stages ranged 8-11. (N.Y. Wkly. Rpt.). NEW JERSEY - Egg masses on 20 percent of sweet corn plants near New Market, Middlesex County. (Ins.-Dis. Newsltr.). DELAWARE - Adults averaged 4 per night in blacklight trap in Sussex County. (MacCreary, June 13). MARYLAND - Adults averaged 7 per night in blacklight trap in Centreville. (U. Md., Ent. Dept., June 7). TENNESSEE - First and second instars infested 98 percent of untreated cornfield planted about mid-April at Springfield, Robertson County. (Pless). INDIANA - Adults throughout State. Most corn less than 20 inches high; some 30-36 inches in southwest district. Feeding light in leaves and whorls on 20 percent of corn plants in earliest planted fields. Moths very low in blacklight traps. (Huber, Matthew). MICHIGAN - Peak moth activity indicated by blacklight traps in Lenawee County June 8-9; 281 adults collected. Negligible in Berrien County. (Newman, June 10). ILLINOIS - Emergence 10 percent in northern sections; complete in central and southern sections. (Ill. Ins. Rpt.). Egg laying and hatch in southern area. (Ins. Sur. Bull.). WISCONSIN - Eggs 2 per 25 plants on field corn 24-28 inches extended leaf near Evansville and Mazomanie; 1 per 25 plants on early sweet corn at Evansville. (Wis. Ins. Sur.). MINNESOTA - Average percent pupation of overwintering larvae by district: Southwest 30, west-central 10, east-central 40, southeast 80. No emergence noted. (Minn. Ins. Rpt.).

IOWA - Pupation 80 percent and moth emergence 20 percent May 31 in cornstalk residue in oatfield at Ankeny, Polk County. (Jess). NORTH DAKOTA - Pupation of overwintering larvae 6 percent in southeast area compared with 11 percent at same time in 1967. No adult emergence. Earliest corn 6 inches high in southern areas of district. (Kaatz). NEBRASKA - First adults taken in light trap at Mead, Saunders County, May 30. Highest counts June 9-11. Egg laying well underway. (Fardal). KANSAS - Egg masses found on 15-20 percent of plants in early planted cornfields in Brown, Nemaha, and Doniphan Counties. Larval feeding damage on 5-10 percent of plants. (Simpson). MISSOURI - Eggs and small larvae infested 25-30 percent of early planted corn (56-60 inches high) in east-central area. (Peters). Hatching in northwest area; feeding damage on less than 1 percent of plants. Egg masses ranged 3-18 per 100 plants on corn more than 30 inches tall. (Munson). ARKANSAS - Second instars feeding in corn tassels in White County. (Wylie).

SOUTHWESTERN CORN BORER (*Diatraea grandiosella*) - **MISSISSIPPI** - Infestations averaged 15 percent in 6 fields of young corn in Webster County. (Dinkins).

CUTWORMS - **WISCONSIN** - Complex still damaged cornfields in Jackson, Outagamie, Oconto, Waushara, and Sauk Counties. Some light damage on corn near Lone Rock, Richland County. Few larvae collected earlier from central sands alfalfa determined *Euxoa scandens*. Some *Agrotis ipsilon* damage in Waushara and Columbia Counties. (Wis. Ins. Sur.). **IOWA** - *Crymodes devastator* larvae (1.0-1.5 inch long) severe on 12,000 untreated acres of corn following sod in Allamakee County. (Iowa Ins. Inf., June 3). **SOUTH DAKOTA** - *A. ipsilon* damaged sorghum near Wessington Springs, Jerauld County, and Chamberlain, Brule County. (Berndt). **KANSAS** - *A. orthogonia* damaging sorghum in Wichita County. (Simpson).

WESTERN CORN ROOTWORM (*Diabrotica virgifera*) - **ILLINOIS** - Hatching begun in northwestern area. (Ins. Sur. Bull.). **MISSOURI** - First hatch of season in Atchison County June 11. (Musick). **KANSAS** - First larvae of season in cornfield in Riley County; first through third instars present. (Wilde).

CORN ROOTWORMS (*Diabrotica* spp.) - **WISCONSIN** - Single small larva taken from corn plants collected from field near Janesville, Rock County; several second instars in corn roots at Arlington June 7. (Wis. Ins. Sur.). **NEBRASKA** - *D. undecimpunctata howardi* active in cornfields in Webster County. (Fox, June 6). **VIRGINIA** - First mating of *D. undecimpunctata howardi* observed in Greenville County cornfield. (Allen).

FLEA BEETLES - **OHIO** - Counts of 8-10 per plant damaging young corn in 10-acre field in Huron County; controls prevented due to wet conditions. (Wells). **MARYLAND** - *Chaetocnema pulicaria* light in Eastern Shore and southern corn production areas. (U. Md., Ent. Dept., June 7).

SEED-CORN BEETLE (*Agonoderus lecontei*) - **MICHIGAN** - Heavy in Lenawee County blacklight trap. (Newman, June 10). **WISCONSIN** - Flights very heavy June 9-10. (Wis. Ins. Sur.).

SUGARCANE BEETLE (*Euetheola rugiceps*) - **ALABAMA** - Adults destroyed 25 percent of corn plants in a 35-acre field at Leroy, Washington County. (Lemons).

SORGHUM MIDGE (*Contarinia sorghicola*) - **TEXAS** - Damaging in scattered areas of Rio Grande Valley and in counties south of Austin. Damaging to date in Maverick, Uvalde, Bexar, Wilson, and Live Oak Counties. Buildup in Hays, Caldwell, Bastrop, and Fayette Counties may cause much damage to late-planted grain sorghum. Some controls in Fayette County and more anticipated. Noneconomic in De Witt, Lavaca, Jackson, Wharton, and Colorado Counties. (Thomas, Green).

SLUGS - **VIRGINIA** - Up to 6 juveniles (0.25 inch long) per square foot caused much damage to sod-planted corn in southern Montgomery County. (Allen, Rowell). **OHIO** - *Deroceras* sp. damaged field corn in Wayne and Holmes Counties, especially in poorly tilled and plowed-down sod areas June 8-12. Damaged garden crops in other areas of State. (Miller). Slugs favored by rainy weather and damp soil conditions. (Rose).

SMALL GRAINS

ENGLISH GRAIN APHID (*Macrosiphum avenae*) - **NORTH DAKOTA** - Averaged 10 per 100 sweeps in Richland and Cass Counties; 90 per 100 sweeps highest on spring wheat in Richland County. (Brandvik, Kaatz). **INDIANA** - Colonies continue to increase on oats in northern and central districts; aphids 5-20 per plant. (Huber).

MEADOW PLANT BUG (*Leptopterna dolabrata*) - **PENNSYLVANIA** - Nymphs 2-3 per plant on wheat in Schuylkill, Centre, and Bedford Counties June 6; feeding punctures evident. (Gesell).

PALE WESTERN CUTWORM (Agrotis orthogonia) - COLORADO - Still on wheat in north-eastern area; little damage. Adults taken in blacklight traps in Weld County. (Johnson).

BARLEY THRIPS (Limothrips denticornis) - NORTH DAKOTA - Migrated into early seeded barley fields in east-central and southeast districts. Adults economic, 3-4 per plant, in few fields in Richland and Cass Counties; 1-2 per plant in other fields. Early seeded barley beginning to head; thrips in leaf sheaths. (Brandvik, Kaatz).

WIREWORMS - MINNESOTA - Damaged primarily small grains in eastern Marshall, Red Lake, and Todd Counties. (Minn. Ins. Rpt.).

BROWN WHEAT MITE (Petrobia latens) - COLORADO - Still in scattered northeast areas; controls necessary. (Johnson).

TURF, PASTURES, RANGELAND

TWO-LINED SPITTLEBUG (Prosapia bicincta) - ALABAMA - Larvae damaging lawn in Andalusia, Covington County; some damage to several native grasses at Lockhart. Adults heavy in lawn in Clarke County; controls required. First-generation adults as far north as Montgomery, Greene, and Lee Counties. (Stephenson et al.).

FALSE CHINCH BUG (Nysius ericae) - TEXAS - Heavy numbers migrated from cotton to lawns at Lubbock, Lubbock County, and Floydada, Floyd County. (Almand).

A COREID BUG (Ceraleptus americanus) - CALIFORNIA - Medium on Bermuda grass in Calexico, Imperial County. (Cal. Coop. Rpt.).

WESTERN TUSSOCK MOTH (Hemerocampa vetusta) - NEVADA - Numbers and damage to bitterbrush (Purshia tridentata) increasing in Galena, Thomas, and White Creek areas of Washoe County between 4,500 and 6,000 feet elevation. Damage heavy to many plants; some migrations to less damaged plants. Larvae vary in size; many late instars. (Bechtel, Horton).

BLUEGRASS BILLBUG (Sphenophorus parvulus) - NEW YORK - Females gravid in Monroe County. One oviposition scar and implanted egg noted on bluegrass stem. (N.Y. Wkly. Rpt., June 10).

A JAPANESE WEEVIL (Calomycterus setarius) - MISSOURI - Collected from bluegrass in Andrew County for a new county record. (Munson).

WHITE GRUBS (Phyllophaga spp.) - KANSAS - Damage continues in native buffalo grass pastures in Thomas, Sheridan, Wallace, Kearney, and Rice Counties. (Bates).

BERMUDAGRASS MITE (Aceria neocynodonis) - OKLAHOMA - Medium to heavy on isolated Bermuda grass lawns in Tulsa County. (Okla. Coop. Sur.).

FORAGE LEGUMES

ALFALFA WEEVIL (Hypera postica) - MAINE - Active in most areas. Much tip damage at Gorham and especially at Westbrook, Cumberland County. Mostly second instars 67 per 100 sweeps; 25 percent first instars, few third. Caught 13 adults June 5 compared with 17 May 15. (Boulanger). VERMONT - Damaged second cutting in much of State. Adults and newly laid eggs heavy. (MacCollom). MASSACHUSETTS - Larvae increased in Hampshire County June 2-8; adults 12-29 and larvae 163-1,125 per 100 sweeps. Damage heavy in heavily infested fields. (Miller). NEW YORK - Tip damage 50+ percent in some Allegany County fields; eggs and adults present; some controls applied. First instars heavy in plant tips in other fields; little damage. Feeding peaked rapidly June 2-6 in Ulster County; first pupation noted June 4. Total damage for 1968 will be less than in 1967. Pupation begun June 5

near Gorham, Ontario County; 50+ percent tip damage in some fields in all sections. Damage economic in Niagara and southern Lewis Counties. Economic damage will extend north of line from East Aurora to Utica as predicted earlier. Larval development speeded by warm weather; damaged fields evident in many central areas. Injury serious in Livingston County; development favored by warm weather. (N.Y. Wkly. Rpt.). NEW JERSEY - Larval injury generally light on sprayed and unsprayed second growth in Burlington, Salem, Gloucester, and Cumberland Counties. (Ins.-Dis. Newsltr.). DELAWARE - Light in most areas. (MacCreary, June 13). MARYLAND - Adults emerging in central and Eastern Shore sections of State; 2-10 per 10 sweeps in 20 acres of alfalfa near Unicorn, Queen Annes County. Adult emergence May 10-15 in laboratory from fourth instars collected April 27 at Beltsville; egg laying in progress. (U. Md., Ent. Dept.). OHIO - Larvae still abundant on unsprayed alfalfa; most damage on first growth over. Severe damage avoided in some fields in northwestern area; generally untreated fields in danger. First cutting for hay 25 percent complete by June 10. (Tucker). Prevention of damage to second growth important concern. Damage to new spring seedlings noted in Wayne, Holmes, Ashland, and Medina Counties; foliar damage and loss evident in many untreated fields in southern sections of 4-county area. Controls generally satisfactory. Stubble treatment in progress; controls may be required if larvae heavy at time of first cutting. (Glass). Some severe browning of first cutting in Williams County; larvae 50-60 per sweep. Adults emerging in southern and central counties. Light damage by new adults expected on many crops. Larvae continue heavy in unsprayed fields; up to 60 per sweep in heavily damaged fields in Ashland and Belmont Counties. (Rose).

MICHIGAN - Adults collected in Jackson, Calhoun, and Kalamazoo Counties June 10 (Newman); Kalamazoo is a new county record (PPC). Counts 10-30 times higher than in 1967 survey. Alfalfa crop harvested; adults near end of life span. Second and third instars 250 per 10 sweeps in some fields June 10. (Newman). Larvae damaged some fields in Lenawee, Monroe, and Berrien Counties June 10. (Ruppel). Especially damaging to young seedlings in Kalamazoo County June 10. (Thompson, Bailey). INDIANA - Pupae ranged 1-5 and larvae 2-9 per stem on untreated first-growth alfalfa in central and east-central districts. Damage heavy to untreated second-growth alfalfa in many central, east-central, and northeastern areas; first cut occurred early to mid-May. Larvae averaged 22 per sweep in second-growth fields; damage moderate to heavy on 50-75 percent of plants. Larvae averaged 7 per sweep as of June 12 on alfalfa cut first week of June in north-central and northeastern districts. Larval counts per sweep on uncut, full-bloom alfalfa ranged 4-24 in northwest, 8-38 in north-central, and 14-45 in northeast districts. Pupation begun in northern districts. (Huber). ILLINOIS - Feeding evident only in northern part of infested area just below line from Watseka to Alton. (Ins. Sur. Bull.). WISCONSIN - Averages in 8 fields June 10 in Kenosha County ranged 2-25 (average 10.4) per 50 sweeps. Slightly higher than last week and much higher than May 21; increase of 50 to 100-fold in fields used in comparison study. Some second instars June 10; most larvae full grown. Some prepupae noted in field; 2 percent in pupal cell in laboratory June 12. (Wis. Ins. Sur.). NEBRASKA - Larvae per 100 sweeps ranged 20-143 in 6 alfalfa fields in Gothenburg and Cozad area and 0-9 in 6 fields near Lexington and Overton. No adults observed. (Keith). OKLAHOMA - Total of 4 larvae collected from alfalfa field 10 miles east of Jay, Delaware County, May 7, 1968, by P.D. Curry. Det. by D.M. Anderson. This is a new State record. (Okla. Coop. Sur.). TEXAS - Larvae collected from Red River, Lamar, and Fannin Counties for new county records. Present in areas along Red River. Significant infestation about 2 miles north of Ladonia, Fannin County. Det. by D.M. Anderson. (Green). COLORADO - Larvae 100-200, adults 0-10 per 100 sweeps in northeastern area. First cutting made in many fields. Larvae 500-3,000 per 100 sweeps (high) in many fields near first cutting in Mesa and Delta Counties. Most fields cut early where high numbers stopped growth. (Johnson, Bulla). WYOMING - Larvae increasing in southeastern area. Averages per 100 sweeps by county: Platte, adults 84 and larvae 530; Goshen, adults 10, larvae 40; Laramie, adults 3 and larvae 30. Most feeding damage light. No adults or larvae found in Albany County. Alfalfa beginning to bud. (Parshall). NEVADA - Larvae ranged 100-150 per sweep in Douglas County; treatments 75 percent complete. Heavy, spotted infestations above normal in western counties in 1968; usually most fields equally infested. (Arnett et al.).

CLOVER SEED WEEVIL (Miccotrogus picirostris) - MISSOURI - Adults active on heads of white and alsike clovers in northwest area. Collected in Andrew, Atchison, Daviess, De Kalb, Gentry, Harrison, Holt, Linn, Livingston, Nodaway, Putnam, and Worth Counties for new county records. (Munson).

SOUTHERN CORN ROOTWORM (Diabrotica undecimpunctata howardi) - NEBRASKA - Adults heavy, especially in sweetclover. Averaged 30 per 10 sweeps in sweetclover field in Lancaster County. (Beland et al., June 8). OKLAHOMA - Adults averaged 5 per 10 sweeps in alfalfa field in Jackson County. (Okla. Coop. Sur.).

FLEA BEETLES (Chaetocnema spp.) - ARIZONA - Up to 40 per 100 sweeps in alfalfa in Cochise County. (Ariz. Coop. Sur.).

PEA APHID (Acyrtosiphon pisum) - MARYLAND - Ranged 60-100 per 10 sweeps on 10 acres of alfalfa near Galena, Kent County. (U. Md., Ent. Dept., June 7).

MICHIGAN - Increased 10-fold on alfalfa past 2 weeks; averaged 250-750 per 10 sweeps. Lady beetles ineffective. (Newman, June 10). INDIANA - Ranged 80-200 per sweep on first-growth alfalfa in northern districts; 40 per sweep on 8 to 14-inch second-growth alfalfa in central and northern districts. (Huber). ILLINOIS - Averaged 150 per sweep on alfalfa in northern area. (Ill. Ins. Rpt.). WISCONSIN - Decreased in most alfalfa in southwest and south-central counties. Counts of 100+ per sweep in occasional field; 10 per sweep common. Decrease due to severe storms, migration, and biological controls. (Wis. Ins. Sur.). NORTH DAKOTA - Increased on alfalfa in eastern area; 2,500 per 100 sweeps common in southern Cass and northern Richland Counties. Parasites and predators light. Alfalfa in late bud stage. (Brandvik, Kaatz). NEBRASKA - Light, 21-120 (average 61) per 100 sweeps, in 6 fields in Dawson County. (Manglitz). KANSAS - Ranged 0-5 per 10 sweeps in alfalfa in northeast area. (Simpson). ARKANSAS - Trace in alfalfa in northwest area probably due to predation, parasitism, and higher temperatures. (Boyer). OKLAHOMA - Averaged 50-60 per 10 sweeps in alfalfa field in Jackson County. (Okla. Coop. Sur.). WYOMING - Ranged 10-1,500 per 100 sweeps in alfalfa in Albany, Goshen, Platte, and Laramie Counties. Heaviest, 600 per 100 sweeps, in Goshen County. (Parshall). COLORADO - Variable in northeastern area. Highest, 5,000-10,000 per 100 sweeps, in field at Severance, Weld County. Remained light, 50-300 per 100 sweeps, in Mesa and Delta Counties. (Johnson, Bulla). ARIZONA - Averaged 155 per 100 sweeps in alfalfa at Yuma, Yuma County. (Ariz. Coop. Sur.).

MEADOW SPITTLEBUG (Philaenus spumarius) - MARYLAND - Adults appearing in alfalfa and red clover throughout State. (U. Md., Ent. Dept., June 7). OHIO - Mostly adults present in State; dispersing to foliage near forage legume fields. Adults very heavy, 68 per sweep, in alfalfa in Belmont County field. Heavier than normal in some areas of State. (Rose). ILLINOIS - Adults ranged 20-50 per sweep on alfalfa in State. (Ill. Ins. Rpt.). WISCONSIN - Adults began appearing June 10 and comprised nearly 10 percent of population in southern area alfalfa by June 12. Spittle masses evident in Ashland County first week of June; corresponds with mid-May in southern area. (Wis. Ins. Sur.). MISSOURI - Adults in northeast and north-central areas. Collected in Grundy, Nodaway, and Worth Counties for new county records. (Munson).

LYGUS BUGS (Lygus spp.) - NEVADA - Heavier than normal in Kings River Valley and Orovala, Humboldt County, and Reese River, Lander County; controls applied. (Lauderdale). ARIZONA - Counts per 100 sweeps on alfalfa by county: Cochise, adults 300 and nymphs 500 in Bonita area; Pinal, adults 280 and nymphs 50 in Chuichu area; Yuma, adults and nymphs 230 in Yuma Valley and 810 in Gila Valley; Maricopa, adults and nymphs 250 in Salt River Valley. (Ariz. Coop. Sur.).

NEW MEXICO - Mostly nymphs 1-3 per sweep on most alfalfa in Lovington area, Lea County. (Eubank, Nielsen). COLORADO - Unchanged; normally 0-100 per 100 sweeps in northeastern area. (Johnson). WYOMING - Lygus sp. nymphs and adults ranged 5-80 per 100 sweeps in alfalfa in Albany, Goshen, Platte, and Laramie Counties. (Parshall).

TARNISHED PLANT BUG (Lygus lineolaris) - ARKANSAS - Adults ranged 100-150 per 100 sweeps in alfalfa in northwest area; noneconomic in alfalfa in State. (Boyer). OKLAHOMA - Averaged 6 per 10 sweeps in alfalfa field in Jackson County. (Okla. Coop. Sur.).

ALFALFA PLANT BUG (Adelphocoris lineolatus) - SOUTH DAKOTA - Adults per 100 sweeps on alfalfa ranged from 200 near Harrisburg, Lincoln County, to 20 near Lyons, Minnehaha County. (Jones). KANSAS - Ranged 2-8 per 10 sweeps on alfalfa in Jackson, Pottawatomie, Doniphan, Brown, and Nemaha Counties. (Simpson).

A FLEAHOPPER (Spanogonicus albofasciatus) - ARIZONA - Counts per 100 sweeps on alfalfa averaged 200 in Stewart District near Willcox, Cochise County, and 20 in Salt River Valley, Maricopa County. (Ariz. Coop. Sur.).

FALSE CHINCH BUGS (Nysius spp.) - ARIZONA - Heavy, 5,000 per 100 sweeps in alfalfa field near Willcox, Cochise County. (Ariz. Coop. Sur.). WYOMING - Nysius sp. adults 350 per 100 sweeps in alfalfa field near La Grange, Goshen County. (Parshall).

WESTERN BROWN STINK BUG (Euschistus impictiventris) - ARIZONA - Averaged 10 per 100 sweeps on alfalfa in Pinal and Maricopa Counties. (Ariz. Coop. Sur.).

CUTWORMS - WISCONSIN - Few larvae collected earlier from central sands area alfalfa determined Euxoa scandens. Some Agrotis ipsilon damage in Waushara and Columbia Counties. (Wis. Ins. Sur.). KANSAS - Peridroma saucia absent in alfalfa in Jackson, Pottawatomie, Doniphan, Brown, and Nemaha Counties. (Simpson). NEBRASKA - P. saucia less than 1 per square foot on alfalfa in Lancaster County. (Keith et al.). COLORADO - Agrotis orthogonia still on alfalfa in northeastern area; little damage. Adults taken in blacklight traps in Weld County. (Johnson).

BEET ARMYWORM (Spodoptera exigua) - NEW MEXICO - Larvae 5-17 per 25 sweeps in Lea County alfalfa. (Eubank, Nielsen). ARIZONA - Averaged 20 per 100 sweeps on alfalfa at Kansas Settlement, Cochise, County. (Ariz. Coop. Sur.).

YELLOW-STRIPED ARMYWORM (Prodenia ornithogalli) - ARIZONA - Larvae 70 per 100 sweeps in alfalfa field at Yuma, Yuma County. (Ariz. Coop. Sur.). OKLAHOMA - Averaged 3 per 10 sweeps in alfalfa field in Jackson County. (Okla. Coop. Sur.).

ALFALFA CATERPILLAR (Colias eurytheme) - MARYLAND - Larvae and pupae averaged 1 per 10 sweeps on alfalfa near Price, Queen Annes County. (U. Md., Ent. Dept., June 7). COLORADO - Larvae 0-20 per 100 sweeps in Weld County. (Johnson).

TWO-SPOTTED SPIDER MITE (Tetranychus urticae) - ALABAMA - Heavy with much damage to large Regal clover field in Lowndes County; controls required. (Mathews).

BROWN WHEAT MITE (Petrobia latens) - COLORADO - Scattered in northeast area; controls necessary. (Johnson).

SOYBEANS

MEXICAN BEAN BEETLE (Epilachna varivestis) - MARYLAND - First adults of season infesting 20 acres of soybeans; damage medium to heavy on 20 percent of planting. (U. Md., Ent. Dept., June 7). VIRGINIA - Numerous in King William County; some feeding but no leaves yet skeletonized. (Andrews). Overwintering adults heavy in Brunswick County; no eggs or larvae but adults mating. Overwintering adults light to heavy in Greenville County; no immature stages observed. (Allen). NORTH CAROLINA - Ranged moderate to heavy in untreated fields in Robeson County; larvae light but eggs heavy. Controls applied. (Johnson, June 10). SOUTH CAROLINA - Present in most fields. Peak emergence from hibernation passed. (Thomas, June 11).

BEAN LEAF BEETLE (Cerotoma trifurcata) - MARYLAND - First adults of season. Defoliation heavy on 50 percent of soybean stand. Adults ranged 2-5 per row foot at Morganza, St. Marys County; damage 10 percent on 15 acres near Roberts, Queen Annes County. (U. Md., Ent. Dept., June 7). MINNESOTA - Present on marginal rows of soybeans in Scott County. (Minn. Ins. Rpt.). MISSISSIPPI - Very light on 2 to 3-inch soybeans in Clay County field. (Dinkins).

PEANUTS

LESSER CORNSTALK BORER (Elasmopalpus lignosellus) - ALABAMA - Larvae damaging several acres of peanuts in 200-acre planting in Coffee County. (Casady).

RED-NECKED PEANUTWORM (Stegasta bosqueella) - TEXAS - Moderate to heavy in Erath and Comanche County fields. (Hamman).

MEXICAN BEAN BEETLE (Epilachna varivestis) - VIRGINIA - One adult per 10 plants in Greensville County field. Generally lighter in other fields in Greensville and Brunswick Counties. (Allen).

TOBACCO THRIPS (Frankliniella fusca) - ALABAMA - Numbers and damage widespread on most untreated peanuts in Geneva County; controls effective. (Reynolds, Bond).

COTTON

BOLL WEEVIL (Anthonomus grandis) - SOUTH CAROLINA - Emergence light; some damage in older fields. Adults per acre in test fields at Florence, Florence County: Treated, 0-90; untreated, 119-806. Adults 2 in 9 groups of potted plants (10 plants per group) in trap plot. Adults in male-baited traps peaked at 677 May 17-24; decreased to 319 May 31-June 7. (Taft et al.). TENNESSEE - Feeding on terminal buds in several fields in lower tier of counties. (Johnson, June 7). ALABAMA - Square infestations high in central and south areas except in and around Monroe County. Controls begun on some farms. First weevil "hatchout" will occur from June 16 to July 5 from southern area up to Montgomery County. "Hatchout" will be delayed in younger cotton. Only one additional weevil (Madison County) collected north of Birmingham. Live weevils per acre by county: Shelby - 312 and 52 at 2 locations; Madison - 50 at one location; Bibb and Perry - 50-750. None found in Franklin or Colbert Counties. (McQueen). MISSISSIPPI - Overwintered weevils mostly very light to light in Clay, Webster, Attala, Sharkey, Union, Montgomery, and Yazoo Counties; egg punctures in some Yazoo County fields. (Dinkins). Single adult found in one of 53 fields checked in delta counties. Two weevils in sex attractant traps; total of 31 to June 14. (Pfrimmer et al.). ARKANSAS - Occasional overwintered weevil found in cotton in eastern area. (Barnes). LOUISIANA - Total of 82 weevils taken from cages and 72 from winged traps in male attractant test in Madison Parish; 17 recovered from cotton plants. Males 40 percent of collections in winged traps and 62.5 percent on cotton plants. Total weevils to date 2,278. Weevils averaged 50 per acre in 3 of 63 fields checked. (Cleveland et al., June 13). TEXAS - Weevils found in 10 of 58 fields checked in McLennan and Falls Counties; averaged 22 (maximum 375) per acre compared with 103 per acre during same time in 1967. Two weevils taken on flight screens; total to date 13 compared with 20 by June 14, 1967. Total of 4 weevils taken in male sex attractant test; total now 903. (Cowan et al.). For Boll Weevil in High Plains area see page 561.

BOLLWORMS (Heliothis spp.) - SOUTH CAROLINA - Caught 5 H. zea in light trap June 1-7 at Florence; total to date 130; no H. virescens. (Taft et al.). ALABAMA - Eggs and scattered larvae in most cotton; no serious infestation. H. zea flights increased sharply in central area. (McQueen). MISSISSIPPI - Larvae averaged 0.7 per 100 terminals in 5 of 53 fields and eggs 2.12 per 100 terminals in 32 fields in delta counties. (Pfrimmer et al.). LOUISIANA - Eggs averaged 210 per acre in 40 of 63 fields in Madison Parish; one larva per field in 3 fields. (Cleveland

et al., June 13). ARKANSAS - Very little H. zea activity in eastern area. (Barnes). H. zea moths very light on sugar lines in Desha County. (Dean). Total of 8 moths taken in blacklight traps at Hope (southwest area) and 9 moths at Kelso (southeast area) June 6-12. (Boyer). TEXAS - Total of 6 eggs and 13 larvae found in 58 fields in McLennan and Falls Counties. Either eggs and/or larvae collected on Texas star, phlox, and spiderwort; 38 larvae previously collected on wild hosts determined H. zea and 8 larvae taken from Texas star determined H. virescens. Total of 248 H. zea and 8 H. virescens determined from wild hosts to date. (Cowan et al.).

BEE T ARMYWORM (Spodoptera exigua) - TEXAS - Moderate to heavy in Kent, Terry, and Cochran Counties; heavy in areas of Dawson and Gaines Counties; very light to light in Lubbock, Floyd, Lynn, and Lamb Counties; decreasing in Mitchell, Lynn, and Martin Counties. Damaging in several areas. Controls in progress in many areas. (Almand, June 11). ARIZONA - Light in Dome Valley, Yuma County, and throughout Cochise County. (Ariz. Coop. Sur.).

EUROPEAN CORN BORER (Ostrinia nubilalis) - ALABAMA - Damaging 60-acre field in Autauga County May 31. Det. by D.M. Weisman. (Dismukes et al.).

COTTON FLEAHOPPER (Psallus seriatus) - NEW MEXICO - Increase begun in northern Eddy County. (Eubank, Nielsen). TEXAS - Light in Dawson, Martin, and Yoakum Counties. (Almand, June 11). Increased sharply in McLennan and Falls Counties; damage in 22 of 58 fields checked. Averaged 10.5 (maximum 39.3) per 100 terminals in 26 treated fields and 14.7 (maximum 61.7) in 32 untreated fields. (Cowan et al.). OKLAHOMA - Averaged 3 per 4 plants in 4 to 6-leaf cotton in Jackson County field. (Okla. Coop. Sur.).

TARNISHED PLANT BUG (Lygus lineolaris) - MISSISSIPPI - Light to moderate in Yazoo County; damage light to squares. (Dinkins). Averaged 0.85 per 100 terminals in 20 fields in delta counties. (Pfrimmer et al.). LOUISIANA - Ranged 2-15 (average 4.8) per 100 sweeps in 10 fields in Madison Parish. (Cleveland et al., June 13).

LYGUS BUGS (Lygus spp.) - ARIZONA - Treatments required in some fields at Roll, Yuma County. Averaged 1 per plant in Willcox area, Cochise County. (Ariz. Coop. Sur.).

APHIDS - TEXAS - Light in Yoakum and Cochran Counties. (Almand, June 11). Light in 52, medium in 2, and heavy in 2 fields in McLennan and Falls Counties. (Cowan et al.).

THRIPS - NEW MEXICO - Heavy in cotton in Artesia area, Eddy County; some controls applied. (Campbell). TEXAS - Light to heavy in Floyd County; medium in Terry County; light in Dawson, Martin, Lamb, Yoakum, and Cochran Counties. Some increase in Lamb County. (Almand, June 11). Light in 54, medium in 3 fields in McLennan and Falls Counties. (Cowan et al.). LOUISIANA - Ranged 0.02-1.29 (average 0.19) per plant in 14 fields in Madison Parish. (Cleveland et al., June 13). MISSOURI - Controls applied in few late-planted southeast area fields. (Jones). TENNESSEE - Increasing in cotton area; damage heaviest in late-planted cotton. (Locke, Johnson). OKLAHOMA - Frankliniella spp. ranged 20-50 per 20 plants in Jackson County. (Okla. Coop. Sur.). ALABAMA - F. fusca and unspecified aphids heavy on untreated 4 to 6-leaf cotton in Madison County. Isolated and heavy in Franklin County. (Bryan, Farrington). ARIZONA - F. occidentalis averaged 5 per plant in Cochise County. (Ariz. Coop. Sur.).

SPIDER MITES - SOUTH CAROLINA - Many infestations in State. (Taft et al., June 7). ALABAMA - Tetranychus urticae damaging field borders on 2 farms in Lee County; controls in progress. (Wilder). MISSISSIPPI - T. urticae moderate in 3 and light in one field in delta counties. (Pfrimmer et al.).

TOBACCO

TOBACCO FLEA BEETLE (Epitrix hirtipennis) - MARYLAND - Adults generally light, 2-7 per plant, on newly transplanted tobacco; shot-hole damage moderate to heavy on 10 acres near Dubois, Charles County. (U. Md., Ent. Dept. June 7).

SUGARBEETS

SPINACH LEAF MINER (Pegomya hyoscyami) - WYOMING - Foliar damage averaged 18 percent in Goshen and Platte Counties. (Parshall). MICHIGAN - Damage continues in some sections of Bay County. (Ruppel, June 10).

BEET LEAF MINER (Pegomya betae) - COLORADO - Larvae heavy, 1-3 per young plant common in Mesa County. (Bulla).

SUGAR-BEET ROOT MAGGOT (Tetanops myopaeformis) - COLORADO - Larvae damaging at Windsor, Weld County; damage 4 percent in one field. (Alldredge).

BEET ARMYWORM (Spodoptera exigua) - ARIZONA - Averaged 5 per plant in Kansas Settlement area, Cochise County. (Ariz. Coop. Sur.).

BEET WEBWORM (Loxostege sticticalis) - COLORADO - Ranged from 0-5 to 300-2,000 in Weld County light traps. (Urano).

LYGUS BUGS (Lygus spp.) - ARIZONA - Averaged 40 per 100 sweeps in Maricopa and Pinal Counties; 5 per plant in Pearce area, Cochise County. (Ariz. Coop. Sur.).

GREEN PEACH APHID (Myzus persicae) - ARIZONA - Moderate in Kansas Settlement, Cochise County. (Ariz. Coop. Sur.).

A BLISTER BEETLE (Epicauta pardalis) - ARIZONA - Damage heavy to field in Bonita, Cochise County. Controls in progress. Det. by F.G. Werner. (Ariz. Coop. Sur.).

A LEAF BEETLE (Erynephala puncticollis) - NEBRASKA - Adults moving into field from alkali-grass pasture in Scotts Bluff County. Adults 4-5 per row foot; egg masses averaged 1 per 3 plants (25 eggs per mass). (Hagen).

MISCELLANEOUS FIELD CROPS

BLACK CUTWORM (Agrotis ipsilon) - SOUTH DAKOTA - Larvae active, up to 12 per row foot, on flax in Codington County. (Berndt).

GREEN PEACH APHID (Myzus persicae) - ARIZONA - Ranged 5-10 per plant in safflower in Kansas Settlement area, Cochise County. (Kozloski).

LYGUS BUGS (Lygus spp.) - ARIZONA - Averaged 3 per plant in safflower in Kansas Settlement, Cochise County. (Ariz. Coop. Sur.).

POTATOES, TOMATOES, PEPPERS

COLORADO POTATO BEETLE (Leptinotarsa decemlineata) - NEW JERSEY - Adults becoming troublesome on potatoes in central and southern counties; egg hatch begun and first instars plentiful. Adults moderate to heavy in most eggplant fields in same area. Injury moderate to heavy in most tomato fields; 35 adults found on one plant in Middlesex County; eggs common and first instars appearing. (Ins.-Dis. Newsltr.). DELAWARE - Larvae numerous in large commercial tomato planting in New Castle County. (MacCreary, June 13). VIRGINIA - Larvae heavy on small patch of bull-nettle in Pittsylvania County. (Allen, Rowell).

GREAT BASIN WIREWORM (Ctenicera pruinina) - IDAHO - Up to 2 per potato seed piece in field at Idaho Falls, Bonneville County. (Moss).

POTATO APHID (Macrosiphum euphorbiae) - NEW JERSEY - Light to moderate in most tomato fields. (Ins.-Dis. Newsltr.).

BLACK CUTWORM (Agrotis ipsilon) - WISCONSIN - Peppers damaged in Waushara County; other cutworms damaged Dunn County tomatoes. (Wis. Ins. Sur.).

EUROPEAN CORN BORER (Ostrinia nubilalis) - NEW JERSEY - Eggs on Middlesex County potatoes; first larvae should appear by June 17. (Ins.-Dis. Newsltr.).

BEANS AND PEAS

MEXICAN BEAN BEETLE (Epilachna varivestis) - ALABAMA - Larvae and adults heavy in 15-acre pea field in Coffee County. Damage heavy in 6-acre snap bean field at Atmore. Nymphs up to 5 per plant. (Casady et al.). NORTH CAROLINA - Moderate to heavy in untreated fields in Robeson County; larvae light but eggs heavy. Controls applied. (Johnson, June 10).

SEED-CORN MAGGOT (Hylemya platura) - MAINE - Common on beans at Auburn, Androscoggin County; skips evident and larvae common June 6. (Boulanger).

PEA APHID (Acyrtosiphon pisum) - WISCONSIN - Increase continues on midseason peas; up to 12 per row foot in 5-inch peas. Counts variable on early peas; some controls applied to commercial fields. (Wis. Ins. Sur.).

COLE CROPS

CABBAGE MAGGOT (Hylemya brassicae) - NEW YORK - Damage severe on untreated or poorly treated early set crucifers in central area. Pupae present. (N.Y. Wkly. Rpt., June 10). VERMONT - Damage severe on untreated and poorly treated crucifers. (MacCollom). MAINE - Infestations and damage developing into serious situation on cabbage and other cole crops at Elizabeth, Cumberland County. Controls ineffective. (Boulanger, June 7).

DIAMONDBACK MOTH (Plutella xylostella) - NORTH DAKOTA - Larvae damaged 50 percent of mustard field near Elliott, Ransom County; larvae 4,500 per 100 sweeps. Adults evident. (Kaatz).

CUCURBITS

STRIPED CUCUMBER BEETLE (Acalymma vittatum) - MARYLAND - Adults active on young cucurbits on Eastern Shore. (U. Md., Ent. Dept., June 7). MISSOURI - Adults active on southeast area cucumbers. (Jones).

LEAFHOPPERS (Empoasca spp.) - ARIZONA - Controls applied to cantaloups to prevent spread of disease from Yuma Valley to Wellton, Yuma County. (Ariz. Coop. Sur.).

SQUASH BUG (Anasa tristis) - OKLAHOMA - Medium on Bryan County squash. (Okla. Coop. Sur.).

SPIDER MITES (Tetranychus spp.) - ARIZONA - Controls applied to cantaloups at Yuma, Yuma County. (Ariz. Coop. Sur.).

GENERAL VEGETABLES

CUTWORMS - TENNESSEE - Little damage reported in 1968 in eastern area. (Quillin, June 7). NEW JERSEY - Amathes c-nigrum flight very heavy June 9. Lacinipolia renigera moths more numerous than in 1967. (Ins.-Dis. Newsltr.).

ASPARAGUS BEETLES (Crioceris spp.) - NEW HAMPSHIRE - Eggs, larvae, and adults of C. asparagi on developing ferns; adults of C. duodecimpunctata active at Durham. (Sutherland, June 10).

SPINACH LEAF MINER (Pegomya hyoscyami) - WISCONSIN - Severe damage to Kenosha County truck garden. Mining begun 2 weeks ago in Dane County; now in swiss chard and red beets. (Wis. Ins. Sur.). NEW JERSEY - Abundant on spinach, beets, and chard in gardens. (Ins.-Dis. Newsltr.).

ONION THRIPS (Thrips tabaci) - COLORADO - Adults 0-8 per onion plant in southwest Weld County. (Johnson). NEW JERSEY - Adults of mostly this species and some other species up to 35 per asparagus spear in Gloucester County field; highest count this season. (Ins.-Dis. Newsltr.).

GREEN PEACH APHID (Myzus persicae) - NEW JERSEY - Beginning to appear on Essex County escarole. (Ins.-Dis. Newsltr.).

BULB MITE (Rhizoglyphus echinopus) - NEW JERSEY - Moderate on onions near Cedarville, Cumberland County. (Ins.-Dis. Newsltr.).

A MILLIPED (Oxidus gracilis) - CALIFORNIA - Heavy on onion bulbs and roots locally in Vallejo, Solano County. (Cal. Coop. Rpt.).

DECIDUOUS FRUITS AND NUTS

CODLING MOTH (Carpocapsa pomonella) - COLORADO - Present in attractant traps in all western fruit areas. Generally few moths taken; up to 30 per trap in some orchards not sprayed in 1967. (Bulla). WISCONSIN - Total of 23 moths taken in blacklight trap at Madison June 6-12. (Wis. Ins. Sur.). INDIANA - Total of 6 overwintering adults in orchard at Vincennes; mostly larvae. (Dolphin, June 10). DELAWARE - Small larvae on unsprayed apples June 10 in Kent County; adult emergence continues from Woodside cage. (MacCreary). NEW JERSEY - Two adults taken in baited jar in Gloucester County. Expected to be abundant on apple June 14 to third week of June. (Ins.-Dis. Newsltr.). NEW YORK - First moth of season taken June 4 in sex pheromone baited trap at Geneva. First emergence in cages June 6. First hatch expected about June 15. (N.Y. Wkly. Rpt.). VERMONT - Adults light in State. (MacCollom).

ORIENTAL FRUIT MOTH (Grapholitha molesta) - NEW JERSEY - Six adults taken in baited jar in Gloucester County. (Ins.-Dis. Newsltr.).

RED-BANDED LEAF ROLLER (Argyrotaenia velutinana) - INDIANA - Major flight of first summer brood in progress. Highest count (1,214 males) in 8 weeks in sex lure traps in orchard at Vincennes. (Dolphin, June 10). MAINE - Hatch underway June 3-7. First instars at West Paris and Monmouth. (Boulanger).

FRUIT-TREE LEAF ROLLER (Archips argyrospilus) - IDAHO - Late instars common on apples, pears, and plums at Moscow, Latah County. (Gittins). VERMONT - Damaged unsprayed fruit trees; pupation begun on black locust. (MacCollom).

LESSER PEACH TREE BORER (Synanthedon pictipes) - INDIANA - Peak flight in progress; 541 males largest weekly catch at 2 Vincennes orchards. (Dolphin, June 10).

MISSOURI - Light to moderate on treated peach in delta area. (Wkly. Rpt. Fr. Grs., June 11).

PEACH TREE BORER (Sanninoidea exitiosa) - TENNESSEE - Damage moderate to heavy in some Loudon County peach trees. (Williams).

PHYCITID MOTHS (Acrobasis spp.) - MICHIGAN - A. tricolorella started emerging June 4 at Hart and Shelby, Oceana County. (MacLean). No emergence at Traverse City. Problem from Hart and Shelby north to Traverse City. (Wooley). CALIFORNIA - A. indigenella larvae heavy on apple at Leucadia, San Diego County. (Cal. Coop. Rpt.).

GREEN FRUITWORM (Lithophane antennata) - MAINE - Moderate damage statewide. Long bloom period prevented controls, but permitted larval development. (Boulanger, June 7).

PLUM CURCULIO (Conotrachelus nenuphar) - NEW JERSEY - Found 18 in short period June 7 and 21 June 10 at Glassboro. (Ins.-Dis. Newsltr.). NEW YORK - Activity increased with warm weather June 4-6 in Clinton County. Much fresh cutting in young apple orchard June 6. (N.Y. Wkly. Rpt.). MAINE - Adults in trees. No oviposition reported as of June 7. (Boulanger).

APPLE CURCULIO (Tachypterellus quadrigibbus) - MISSOURI - Moderate on treated apple in northeast area. (Wkly. Rpt. Fr. Grs., June 11).

APHIDS - COLORADO - Dysaphis plantaginea light in early treated apple orchards. (Bulla). SOUTH CAROLINA - D. plantaginea very scarce on apple during 1968 compared with 1967. (Nettles, June 11). MAINE - Rhopalosiphum fitchii alates developing late in most areas due to unfavorable weather. (Boulanger, June 7).

ARMORED SCALES - FLORIDA - First and second sedentary stages of second-generation Pseudaulacaspis pentagona on peaches at Gainesville, Alachua County. Det. by L.C. Kuitert. (Fla. Coop. Sur.). NEW HAMPSHIRE - Lepidosaphes ulmi hatching at Warren June 4. (Hutchins).

BLACK SCALE (Saissetia oleae) - CALIFORNIA - Heavy on apricot at Hollister, San Benito County. (Cal. Coop. Rpt.).

APPLE LEAFHOPPER (Empoasca maligna) - COLORADO - Injured few apple orchards at Eckert, Delta County. (Bulla).

PEAR PSYLLA (Psylla pyricola) - WISCONSIN - Nymphs active on Dane County pear trees. (Wis. Ins. Sur.).

APPLE MAGGOT (Rhagoletis pomonella) - INDIANA - First 6 adults of season on bait boards June 7-10 at Vincennes. (Dolphin). WISCONSIN - Several in blacklight trap June 9; none on sticky trap at Madison, Dane County. (Wis. Ins. Sur.).

TEPHRITID FLIES (Rhagoletis spp.) - WISCONSIN - Two R. fausta adults collected in Door County cherry orchard June 7. (Wis. Ins. Sur.). NEW YORK - First R. fausta emergence June 4 from seeded cage in Niagara County. R. cingulata emerging since June 3 at Orleans and Monroe; first adults collected in cages at Geneva June 5. Emergence light since then. (N.Y. Wkly. Rpt.).

EUROPEAN APPLE SAWFLY (Hoplocampa testudinea) - NEW HAMPSHIRE - Heaviest injury in State on untreated orchard at Kensington. (Sutherland, June 10).

PEAR-SLUG (Caliroa cerasi) - CALIFORNIA - Larvae heavy, defoliated plum at Oceanside, San Diego County. (Cal. Coop. Rpt.).

EUROPEAN RED MITE (Panonychus ulmi) - MISSOURI - Light to moderate on treated apple in central area. (Wkly. Rpt. Fr. Grs., June 11). INDIANA - Increasing on foliage due to favorable weather in apple orchards at Vincennes. Eggs 2.10-15.66, immatures 0.31-1.51, and adults 0.43-2.02 per leaf. Eggs increased 3 to 4-fold; sharp population increase expected. (Dolphin, June 10). MAINE - Heavy statewide where controls absent or ineffective. Summer egg laying heavy. (Boulanger, June 7).

PECAN NUT CASEBEARER (Acrobasis caryae) - OKLAHOMA - Larvae in 8-10 percent of pecan nutlets in Garvin County; hatching in 10 percent of nut clusters in Payne County; light in Tulsa County. (Okla. Coop. Sur.). ALABAMA - Larvae light; feeding on young pecans in Baldwin County. (Estes).

APHIDS (Monellia spp.) - ALABAMA - Damaging many pecan trees in central and southern areas past 2-3 weeks. (Leeper et al.).

WEATHER BUREAU'S 30-DAY OUTLOOK

MID-JUNE TO MID-JULY

The Weather Bureau's 30-day outlook is for temperatures to average above seasonal normals from the northern and central Plains eastward to the Middle and North Atlantic Coast States. Below normal averages are indicated for the South Atlantic Coast States, most of Texas, and west of the Continental Divide except for near normal along the central and south Pacific coast. Elsewhere near normal temperatures are in prospect. Precipitation is expected to exceed normal over the Pacific Northwest, the southern Plateau region, the Great Lakes region, and along the south Atlantic coast. Subnormal totals are indicated for the central and south Pacific coast, the Great Basin, and also over portions of the central Plains, the lower Mississippi Valley, and the Tennessee Valley. In unspecified areas near normal precipitation is expected.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the Weather Bureau. You can subscribe through the Superintendent of Documents, Washington, D. C. 20250. Price \$5.00 a year.

WEATHER OF THE WEEK ENDING JUNE 17

HIGHLIGHTS: The Far Southwest was mostly hot and dry; Deep South, hot, humid, and rainy; the rest of the Nation, cool, cloudy, and wet.

PRECIPITATION: No rain or only very light sprinkles fell in California, Nevada, Utah, Arizona, and nearby portions of neighboring States. The irregular pattern over the rest of the Nation resulted from light to heavy showers and thunderstorms. Much severe weather occurred in the hot, humid air which lay south and east of a slow-moving cold front. Severe thunderstorms occurred Monday, June 10, from Minnesota to northwestern Texas. During the day, about a score of tornadoes occurred from Wisconsin to Texas. Light showers fell in the Far Northwest and along the Atlantic seaboard. By midweek torrential downpours were prevalent in the East. Violent weather continued in mid-America with another score of tornadoes touching down, mostly in the northern Great Plains. One tornado tore through Tracy, Minnesota, killing 9 persons, injuring 125, and causing heavy damage to residential property. Thunderstorms rumbled day and night from the Dakotas to Texas and Louisiana. Many were accompanied by hail, damaging winds, and torrential rains.

TEMPERATURE: The West warmed during the week with temperatures reaching normal or above by the weekend. A large area from California to Utah averaged warmer than normal. Warm weather prevailed over mid-America during the first half of the week. Some localities in Colorado, Nebraska, and Kansas registered 100° or higher on Thursday before arctic air moved in to bring a cool weekend. Temperatures in North Dakota averaged about 6° below normal; in eastern Texas, about 5° above normal. A hot spell which had persisted over the East for 6 or 7 days ended about Friday when arctic air moved in. Some warming occurred over the weekend. Temperatures averaged near normal. (Summary supplied by Environmental Data Service, ESSA.)

CITRUS

CITRUS THRIPS (Scirtothrips citri) - ARIZONA - Controls applied to nursery trees at Yuma, Yuma County. (Ariz. Coop. Sur.).

SMALL FRUITS

FLEA BEETLES (Altica spp.) - VERMONT - A. chalybea very destructive to wild grape in State. (MacCollom). MAINE - A. sylvia moderate to heavy numbers and damage on lowbush blueberry at Shapleigh, York County. Light numbers and damage at Sedgwick, Hancock County, and Jonesboro, Washington County. (Boulanger, June 7).

STRAWBERRY WEEVIL (Anthonomus signatus) - NEW HAMPSHIRE - Adults common on blooms in southern area. (Mason, Sutherland, June 10).

CURRENT SPANWORM (Itame ribearia) - NORTH DAKOTA - Larval damage heavy on currant at Fargo, Cass County; controls applied. (McBride).

MEADOW SPITTLEBUG (Philaenus spumarius) - WISCONSIN - Heavier than normal on strawberry plants in Grant, Barron, Winnebago, Wood, and Dane Counties. (Wis. Ins. Sur.).

RASPBERRY SAWFLY (Monophadnoides geniculatus) - MINNESOTA - Moderate on raspberry plants in nurseries at Aitkin, Aitkin County, and Remer, Cass County. (Minn. Ins. Rpt.).

A PLANARIAN FLATWORM (Geoplanea mexicana) - CALIFORNIA - Heavy and damaging strawberry fruit at Vallejo, Solano County, and St. Helena, Napa County. (Cal. Coop. Rpt.).

ORNAMENTALS

ROSE CHAFER (Macrodactylus subspinosus) - MARYLAND - Adults very heavy; active and mating on hedge roses near Salisbury, Wicomico County. (U. Md., Ent. Dept., June 7). RHODE ISLAND - Adults in Washington County June 13. (Mathewson). VERMONT - Adults increasing in State. (MacCollom). NEW HAMPSHIRE - Adults active at Durham. (Sutherland, June 10).

BAGWORM (Thyridopteryx ephemeraeformis) - TENNESSEE - Heavily damaged unsprayed ornamentals in Davidson and Williamson Counties. (Bogard, Quillin). NEW JERSEY - Beginning activity. (Ins.-Dis. Newsltr.).

LILAC BORER (Podosesia syringae syringae) - MICHIGAN - Adult activity noted at Lansing. Egg laying begun. (Wallner, June 10).

EIGHT-SPOTTED FORESTER (Alypia octomaculata) - WISCONSIN - Adults begun flying in Dane County. (Wis. Ins. Sur.).

ARMORED SCALES - MICHIGAN - Unaspis euonymi crawler activity at maximum. (Wallner, June 10). WISCONSIN - About 75 percent Lepidosaphes ulmi hatch with about 20 percent emergence from beneath scale by June 6 in Langlade County. Lilac, spirea, and honeysuckle at peak of bloom June 6. (Wis. Ins. Sur.).

SOFT SCALES (Lecanium spp.) - DELAWARE - First L. cerasorum crawlers of season June 4. (MacCreary). OHIO - L. fletcheri females dead June 6; eggs under scales on taxus in Highland County. (Cooley).

FLOWER THRIPS (Frankliniella tritici) - ALABAMA - Adults and nymphs of this and other species very heavy, 10-50 per blossom, on roses and daylilies throughout State; damage heavy. (McQueen).

TWO-SPOTTED SPIDER MITE (Tetranychus urticae) - ALABAMA - Damage increasing on roses and other ornamentals in Lee County; numerous plants defoliated in several home plantings. (Bagby et al.).

FOREST AND SHADE TREES

MOUNTAIN PINE BEETLE (Dendroctonus ponderosae) - CALIFORNIA - Infested 1,000 acres of sugar pines in Trinity-Shasta National Forest, Butte County; over 40 trees killed by continuing infestation from fall 1967. Activity above normal. (Anderson, USFS).

WEEVILS - ARKANSAS - Hylobius pales remained active; appearing at lights. Pissodes nemorensis decreased in State. (Roberts, Barnes).

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana) - OHIO - Pupation in progress in Butler County June 5. Damaged new mugho pine shoots. (Cooley). DELAWARE - Adults emerged from pine terminals. (MacCreary, June 13). NEW JERSEY - Should begin emerging very shortly. (Ins.-Dis. Newsltr.).

NANTUCKET PINE TIP MOTH (Rhyacionia frustrana) - OKLAHOMA - First-generation adult emergence 50 percent from pine plantings in McCurtain County; damage heavy, infested 60-80 percent of upper terminals. (Okla. Coop. Sur.). ARKANSAS - Activity very light due to active predators and unfavorable weather. (Roberts, Barnes).

JACK-PINE BUDWORM (Choristoneura pinus) - WISCONSIN - Larvae plentiful at Douglas, Marquette County, and at Bayfield, Bayfield County; second and third instars early in week. Half of larvae in fifth instar in Jackson County June 11. (Wis. Ins. Sur.). MINNESOTA - Mostly third instars feeding on new needles in north and east-central areas. (Minn. Ins. Rpt.).

PINE WEBWORM (Tetralopha robustella) - NEW JERSEY - Infested white and red pines in Union County. (Ins.-Dis. Newsltr.).

A GELECHIID MOTH (Exoteleia nepheos) - OHIO - Pupation begun in candles of Scotch pine in Lake County; parasitism 32 percent. (Campbell).

PINE SPITTLEBUG (Aphrophora parallela) - WISCONSIN - Spittle masses disappeared on jack pine in western Dane County and late nymphs about to moult. Generally high, infested nearly every shoot of jack pine in Douglas and Bayfield Counties. (Wis. Ins. Sur.). VIRGINIA - Nymphs light on Rockbridge County white pine; heavily infested adjacent Scotch pines. (Woodside, June 5). NEW HAMPSHIRE - General and common on pines. (Conklin, Sutherland, June 10).

CONIFER SAWFLIES - ARKANSAS - Neodiprion taedae linearis feeding completed in southern area; about over in northern area. (Roberts, Barnes). IOWA - N. sertifer larvae heavy in 160-acre Christmas tree plantation in Clinton County. (Iowa Ins. Inf., June 3). OHIO - First and second instars of Diprion frutetorum fed on Scotch pine in Lake County. (Campbell).

ADELGIDS (Adelges spp.) - DELAWARE - A. cooleyi nymphs on Douglas-fir in State. (MacCreary, June 13). VERMONT - Adelges spp. galls common on Norway and red spruce. (MacCollom). MAINE - A. abietis serious on ornamental spruces in southern area; some trees with several hundred galls. Moderate infestations and damage in Aroostook County. (Boulanger, June 7).

WHITE-PINE APHID (Cinara strobil) - NEW HAMPSHIRE - Colonies increasing; much honeydew and lateral twig dieback expected if buildup continues. (Conklin, June 10).

PINE NEEDLE SCALE (Phenacaspis pinifoliae) - IOWA - Hatched at Ames, Story County. Crawlers settled but no wax secreted. (Iowa Ins. Inf., June 3). NEW HAMPSHIRE - Hatching at Durham June 3. (Conklin).

PINE TORTOISE SCALE (Toumeyella numismaticum) - WISCONSIN - Crawlers appearing in Dane County. (Wis. Ins. Sur.).

ELM LEAF BEETLE (Pyrrhalta luteola) - NEVADA - Mostly first and some second instars at Reno and Sparks, Washoe County. (Nev. Coop. Rpt.). COLORADO - First instars on Mesa County elm. (Sisson). TEXAS - Larvae continue damaging in Glasscock County. (Lindsey). OKLAHOMA - Feeding damage of first-generation late instars moderate to heavy; defoliated up to 20 percent of some Chinese elms in Payne County. (Okla. Coop. Sur.). NEBRASKA - Eggs and larvae on Gage County elms (McClure). Larvae skeletonized leaves in Red Willow County. (Keith, Klein, June 5). MISSOURI - First-generation larvae pupated in Boone County. (Peters). IOWA - Adults and eggs at Fairfield, Jefferson County, for new county record. (Iowa Ins. Inf., May 27). OHIO - Hatch begun; some early instars on elm foliage in Licking County (Walker) and probably elsewhere in central and southern areas (Rose). RHODE ISLAND - Adults fed on Washington County elms June 13. (Mathewson). NEW HAMPSHIRE - Laid eggs at Durham, Strafford County. (Sutherland, June 10).

IMPORTED WILLOW LEAF BEETLE (Plagiodera versicolora) - MARYLAND - Defoliation heavy on willows in Zikiah Swamp, St. Marys County. (U. Md., Ent. Dept., June 7). RHODE ISLAND - On Washington County elms June 13. (Mathewson). NEW HAMPSHIRE - Larvae and adults damaged foliage June 5 at Durham, Strafford County; eggs present. (Sutherland).

LARGER ELM LEAF BEETLE (Monocesta coryli) - VIRGINIA - Adults medium on American elms in Southampton County. (Harrell, Freund, June 7).

NATIVE ELM BARK BEETLE (Hylurgopinus rufipes) - WISCONSIN - Preparing nuptial chambers and egg galleries in Menominee County elms June 4; adults, eggs, and larvae present. (Wis. Ins. Sur.).

A JUNE BEETLE (Phyllophaga sp.) - MICHIGAN - Flights heavy in some areas of Lower Peninsula; emergence expected further north week of June 17. (Wallner).

EASTERN TENT CATERPILLAR (Malacosoma americanum) - OHIO - Adults emerging in central and southern areas. (Rose). IOWA - Widespread in southeast quarter of State; 1-2 webs on one-third of trees along roadsides. Larvae full grown. (Mast, May 27).

CANKERWORMS - SOUTH DAKOTA - Paleacrita vernata defoliated shade elms near Pickstown, Charles Mix County, and Spearfish, Lawrence County. Controls applied. (Jones). OHIO - Alsophila pometaria larvae destroyed 50 percent of pin oak foliage May 29 at Toledo, Lucas County. (Jones).

MOURNING-CLOAK BUTTERFLY (Nymphalis antiopa) - NORTH DAKOTA - Second and third instars damaged elms at Fargo; controls applied. (McBride). NEW JERSEY - Feeding on shade trees in Ocean County. (Ins.-Dis. Newsltr.).

A PSYCHID MOTH (Apterona crenulella) - NEVADA - Collected on elm at Button Point east of Winnemucca, Humboldt County; second find in county. (Kubota).

SATIN MOTH (Stilpnotia salicis) - VERMONT - Larvae defoliated poplar in Addison County. (MacCollom).

FALL WEBWORM (Hyphantria cunea) - ARKANSAS - Black-headed strain light in southern area; first webs collected May 13. Second to fourth instars present; 30-40 percent parasitized. (Roberts, Barnes).

GREEN-STRIPED MAPLEWORM (Anisota rubicunda) - TENNESSEE - Defoliated maple shade trees in Knox County. (Williams).

BIRCH LEAF MINER (Fenusa pusilla) - WISCONSIN - General statewide; hatched on white birch in Langlade County June 6 and small larvae just begun mining. (Wis. Ins. Sur.). RHODE ISLAND - Adults at Kingston, Washington County. (Field).

VERMONT - Mines ranged from very small to large enough to cover entire leaf surface. (MacCollom). MAINE - Heavy numbers and damage on birches in Presque Isle area. (Boulanger, June 7).

BROWN-HEADED ASH SAWFLY (Tomostethus multicinctus) - IOWA - Infested ash trees in central area. (Iowa Ins. Sur.).

COTTONY MAPLE SCALE (Pulvinaria innumerabilis) - MAINE - Infestations sufficiently large at Farmington, Franklin County, to warrant controls. (Boulanger, June 7).

PERIODICAL CICADAS (Magicalcada spp.) - OHIO - Adults (17-year race) active over most of brood area. Nymphal emergence in orchards and edges of woods almost complete; skins abundant in many shaded wooded areas; peak emergence nearing end. Emerged in Jefferson, Columbiana, Mahoning, and Trumbull Counties. Mating increased. Egg laying begun on young, sun-exposed trees few days before June 12, especially in southern section of brood area. "Singing" of M. septendecim and M. cassini noted in Brood VIII emergence area. (Forsythe).

INSECT DETECTION

New State Record

ALFALFA WEEVIL (Hypera postica) - OKLAHOMA - Larvae collected from alfalfa field 10 miles east of Jay, Delaware County, May 7, 1968, by P.D. Curry. Det. by D.M. Anderson. (p. 545).

New County Records

A JAPANESE WEEVIL (Calomycterus setarius) - MISSOURI - Andrew County. (p. 544).

ALFALFA WEEVIL (Hypera postica) - MICHIGAN - Kalamazoo County. TEXAS - Red River, Lamar, and Fannin Counties. (p. 545).

CLOVER SEED WEEVIL (Miccotrogus picrostris) - MISSOURI - Andrew, Atchison, Daviess, De Kalb, Gentry, Harrison, Holt, Linn, Livingston, Nodaway, Putnam, and Worth Counties. (p. 546).

MEADOW SPITTLEBUG (Philaenus spumarius) - MISSOURI - Grundy, Nodaway, and Worth Counties. (p. 546).

ELM LEAF BEETLE (Pyrrhalta luteola) - IOWA - Jefferson County. (p. 557).

CEREAL LEAF BEETLE (Oulema melanopus) - PENNSYLVANIA - Greene County. (p. 561).

MAN AND ANIMALS

MOSQUITOES - WYOMING - Aedes dorsalis, A. vexans, and A. fitchii adults common, annoying in Cheyenne, Laramie County. (Rich). MINNESOTA - A. vexans in 80 percent of 1,063 larval collections June 2-8 and accounted for 80 percent of 4,243 females taken in light trap collections June 1-7 in Metropolitan Mosquito Control District. Only 140 females taken previous period. (Minn. Ins. Rpt.). WISCONSIN - Some mosquito activity in most counties; biting of man and cattle severe. Most annoyance by woodland species; A. cinereus biting June 12 in Wisconsin River area. Larvae in dryer, upland areas of Vilas County June 3 lighter than in lower muskeg regions of Iron County. Mosquitoes problem in Dodgeville, Iowa County, for first time in several years. (Wis. Ins. Sur.). MICHIGAN - A. vexans annoying in many areas after recent heavy rains and current warm temperatures. (Newman, June 10). VERMONT - Mosquito annoyance severe in all areas. (MacCollom). MAINE - Mainly woods-pool Aedes spp. heavy in central and eastern areas week of June 3. Ample water will permit strong second generation to develop in late June. (Boulanger, June 7).

SCREW-WORM (Cochliomyia hominivorax) - Total of 107 cases reported in U.S. June 9-15 as follows: TEXAS - Bee 6, Brooks 6, Cameron 2, De Witt 10, Hidalgo 2, Jim Wells 4, Karnes 2, Kenedy 9, Kleberg 1, Medina 9, Terrell 2, Uvalde 9, Frio 6, Nueces 2, Real 1, Tom Green 1, Atascosa 1, Caldwell 1, Edwards 1, Jim Hogg 1, Wilson 1, Zavala 1; NEW MEXICO - Grant 1; ARIZONA - Pima 7, Santa Cruz 7, Gila 1, Cochise 4, Yuma 2, Graham 1, Maricopa 2; CALIFORNIA - Imperial 3, San Diego 1. Total of 466 cases reported in portion of Barrier Zone in Republic of Mexico as follows: Baja California 2, Territorio sur de Baja California 3, Sonora 157, Chihuahua 35, Coahuila 137, Nuevo Leon 53, Tamaulipas 79. Total of 49 cases reported in Mexico south of Barrier Zone. Barrier Zone is area where eradication operation underway to prevent establishment of self-sustaining population in U.S. Sterile screw-worm flies released: Texas 61,968,000; New Mexico 720,000; Arizona 13,520,000; California 1,500,000; Mexico 92,780,000. (Anim. Health Div.).

FACE FLY (Musca autumnalis) - MISSOURI - Averages in 10-cow counts in central area ranged 0.5-6.7 (averaged 3.5) per cow. (Thomas). VIRGINIA - Adults ranged 0-6 (averaged 3) per animal on Hereford cows in Hanover County. Very light at dairy in Spotsylvania County. (Allen). VERMONT - Annoying pasture cattle; adults 10-15 per head as of June 11. (MacCollom).

HORN FLY (Haematobia irritans) - MISSISSIPPI - Variable over State. Counts per head by county: Clay, 100 on 125 head; Webster, 300 on 20; Tallahatchie, 75 on 200; Attala, 75 on 500; Hinds, 29 on 420; Tate, 175 on 55; Montgomery, 75 on 35 head. (Dinkins). ARKANSAS - Increased to 400-500 per head in untreated herds in northwest area. (Simco). TEXAS - Heavy on Jackson County cattle. (Wilson). OKLAHOMA - Increasing across State. Counts per head on untreated cattle ranged 800-3,000 on bulls, 600-1,000 on mature cows, and 700-1,200 on two-year-old steers. (Okla. Coop. Sur.). MISSOURI - Averages in 10-cow counts in Boone County ranged 49.8-455.0 (averaged 289.5) per cow and on Cooper County farm, 995 per cow. (Thomas). NORTH DAKOTA - Adults ranged up to 300 per head on beef herds in Cass and Richland Counties; herd averages ranged 3-200 per head. (Brandvik). MINNESOTA - Adults averaged 10 per head on cattle in southeast district; much variation between milking cows and beef cattle or young stock. Much lighter on milking cows. Adult increase should begin in few weeks. (Minn. Ins. Rpt.). VIRGINIA - Adults ranged 40-800 on unsprayed Hereford herd; ranged 3-18 per head on cattle using back rubber in pasture 0.25 mile away in Hanover County. Ranged 40-500 per head on dairy herd in Spotsylvania County. (Allen). VERMONT - Prevalent, several hundred per head, in Shoreham area. (MacCollom).

STABLE FLY (Stomoxys calcitrans) - OKLAHOMA - Averaged 4-5 per head on isolated cattle in Payne County. (Okla. Coop. Sur.). ILLINOIS - Beginning to increase in barns. (Ins. Sur. Bull.). VERMONT - Annoying to cattle in State. (MacCollom).

TABANID FLIES - MISSISSIPPI - Tabanus spp. 30 per head on herd of 20 cattle in Webster County and 20 per head on 500 cattle in Attala County. Heavier than in past few years. (Dinkins). WISCONSIN - Deer flies biting in parts of Dane, Portage, Rusk, and Waupaca Counties. (Wis. Ins. Sur.).

A LOUSE FLY (Lipoptena mazamae) - OKLAHOMA - Adults increasing in east-central area. Counts averaged 20-50 per head on fawns in Cherokee County. Annoying man in above area. (Okla. Coop. Sur.).

HARD-BACKED TICKS - OKLAHOMA - Amblyomma americanum adults and nymphs averaged 25 per 6-square-inch area on cattle in Cherokee County. Larvae appearing. One thousand nymphs and adults around head region of two 10-day-old fawns; one fawn blinded by numerous ticks in eyes. Heavy across eastern third of State. (Okla. Coop. Sur.). WISCONSIN - Dermacentor variabilis prevalent in wooded areas of southern and northern counties; not as numerous as previously. (Wis. Ins. Sur.).

BROWN RECLUSE SPIDER (Loxosceles reclusa) - ALABAMA - Specimen collected from home in Colbert County. Several specimens collected from home in Franklin County. (Holloway, Ponder).

HOUSEHOLDS AND STRUCTURES

CRAZY ANT (Paratrechina longicornis) - CALIFORNIA - Medium in Indio, Riverside County. This infestation originally reported in 1944 in Date Introduction Gardens; spread now 2 blocks from original infestation. Spread also occurred in 2 locations in San Diego, San Diego County. (Cal. Coop. Rpt.).

EUROPEAN EARWIG (Forficula auricularia) - CALIFORNIA - Heavy in yards and residences in San Marcos, San Diego County. (Cal. Coop. Rpt.).

BENEFICIAL INSECTS

LADY BEETLES - WYOMING - Ranged 1-44 (averaged 15) per 100 sweeps in alfalfa in Goshen, Platte, and Laramie Counties; few larvae present. (Parshall). NEBRASKA - Adults numerous, 64 per 5 sweeps, in field near Lexington, Dawson County. (Manglitz).

A FLOWER BUG (Orius insidiosus) - ARKANSAS - Continues most abundant beneficial insect in alfalfa in northwest area; mostly adults 100-200 per 100 sweeps. (Boyer).

A DAMSEL BUG (Nabis sp.) - WYOMING - Averaged 8 per 100 sweeps in alfalfa in Goshen, Platte, and Laramie Counties. (Parshall).

HYMENOPTEROUS PARASITES - MICHIGAN - During period May 27-June 9, 4 species released at 34 sites in southern 2 tiers of counties and in Eaton County for control of alfalfa weevil. Releases as follows: Approximately 9,000 Tetrastichus incertus (a eulophid wasp) at 34 sites; 4,500 Bathyplectes curculionis (an Ichneumon wasp) at 31 different sites; several hundred B. contracta in Cass County near Niles. B. contracta, a larval parasite recently introduced from Sweden, believed to be as good or better than B. curculionis. About 200 Microctonus aethiops (a braconid) released in Lenawee and Cass Counties. (Stehr).

A SPHECID WASP (Tachysphex terminatus) - IDAHO - Adults numerous 1 mile west of Ditto Creek on Mayfield Road, Elmore County; were provisioning nest with grasshoppers. (Fletcher).

FEDERAL AND STATE PLANT PROTECTION PROGRAMS

BOLL WEEVIL (*Anthonomus grandis*) - TEXAS - In High Plains area, overwintered weevils averaged 130 per acre in parts of Mitchell County as of June 11. No weevils detected in cotton in Howard County by same date; however, 12 overwintered weevils taken in 12 sex attractant traps. (Almand). For Boll Weevil in other areas see page 548.

CEREAL LEAF BEETLE (*Oulema melanopus*) - MICHIGAN - Population dynamics survey on oats. Ensley Township, Newaygo County: First larvae June 3; ranged 30-60 larvae and 5-10 adults per 100 sweeps. (Very lightly infested in 1967). Riga Township, Lenawee County: Heavy larval increase June 7. Pulaski Township, Jackson County: Adults decreasing rapidly. One field yielded 429 larvae and 30 adults in 50 sweeps while another 2 miles away produced 2 larvae; however, general condition that of heavy infestation. Elmwood Township, Tuscola County: Only 26 adults and larvae in 104 fields; ranged 10-30 larvae and adults per 100 sweeps week of May 27. Ray Township, Macomb County: Very light, negative in most fields. Dorr Township, Allegan County: Heavy, up to 1,000 larvae and 50 adults per 100 sweeps. One oatfield yielded 3,869 larvae and many adults, highest single count reported. Damage will result if sprays not applied. (Janes, June 10). Heavy larval activity on Allegan County oats. (Thompson, June 10). Hatch nearly complete and damage evident in many oatfields in Berrien County. Heading obscured damage to wheat. (Ruppel, Gomulinski, June 10). PENNSYLVANIA - Counts per 100 sweeps by county: Beaver - larvae 5-7; Lawrence - larvae 4-6 and adults 2. Collected in Greene County June 3, 1968, for a new county record. (Eckess). ARKANSAS - Surveys negative in 14 counties in northeast area and in Garland County during May. (Shotts).

A GRASS BUG (*Irbisia pacifica*) - IDAHO - Up to 2 per quackgrass leaf in about 30-foot roadside area of Kamiah, Lewis County. (Sellers).

GRASSHOPPERS - NEW MEXICO - Mostly first and second instars damaging grain sorghum and soybeans in Lovington area, Lea County; some fields treated. Damage serious to seedling cotton in above area; controls applied to heavily infested fields. First through third instars 10-15 per square yard in alfalfa in eastern Valencia County. (Heninger). Spotted heavy population damaging alfalfa in Lea County. (Gilstrap). Mostly first and second instars heavy, 8-45 per square yard, June 3-7 on 78 sections of rangeland in De Baca County. Hatch not complete as of June 7. (Judd, Peabody). WYOMING - Hatch of early season rangeland species continues in Glendo and Guernsey study plots, Platte County. *Trachyrhachys kiowa* hatch begun. (Pfadt). MISSOURI - Small *Melanoplus* spp. nymphs light, 2-12 per 10 sweeps, on alfalfa, red clover, and roadside and fence row vegetation. (Munson). NEBRASKA - First and second instars ranged 15-20 per square yard in fence rows in Scotts Bluff and Morrill Counties. (Hagen). SOUTH DAKOTA - Hatch continued across much of State. In Sanborn and Davison Counties, up to 25-30 per square yard in field margins, and up to 50 per square yard in weedy areas along fence lines. In alfalfa fields, 3-5 per square yard. Moved into oatfields, but little damage noted northeast of Woonsocket, Sanborn County. *Melanoplus bivittatus* and *M. differentialis* dominant. *M. bivittatus* mostly second and third instars; *M. differentialis* mostly first and second. Some emergence of *M. femurrubrum*; few *M. confusus* adults. First cutting of alfalfa underway. Warmer weather and removal of alfalfa should increase hatch, particularly in problem areas with light sandy soils. (Burge). Mostly *M. bivittatus* at margins of wheatfields north of Quinn, eastern Pennington County; first and second instars up to 30 per square yard. (Kantack). NORTH DAKOTA - Light hatch continues in southeast. Ranged up to 8 per square yard in field margins; to 10 per square yard in some alfalfa. Development ranged first through fourth instar. No hatch of *M. differentialis* or *M. femurrubrum*. (Brandvik). MINNESOTA - Hatch continues; no serious infestation in southwest, west-central, central, or southeast districts. *M. differentialis* hatch begun in southwest district. *M. femurrubrum* eggs in eyespot to segmentation stage; hatch should start next 7 days in lighter soil areas. (Minn. Ins. Rpt.). MICHIGAN - Nymphs low in all alfalfa surveyed. (Newman, June 10).

ILLINOIS - Nymphs of various species ranged as high as 8-10 per square yard in roadsides in west and southwestern sections. (Ill. Ins. Rpt.).

IMPORTED FIRE ANT (Solenopsis saevissima richteri) - ARKANSAS - Surveys negative outside infested areas in Ashley, Chicot, and Union Counties during May. Also negative in Bradley and Drew Counties. (Shotts).

JAPANESE BEETLE (Popillia japonica) - TENNESSEE - First specimens of season collected in Monroe County June 10. (Coppinger). VIRGINIA - Adults infested roses, knotweed, grapes, and flowering quince in Prince Edward County. (Peery).

PINK BOLLWORM (Pectinophora gossypiella) - ARIZONA - Larvae in flowers and bolls of cotton from Gadsden to Texas Hill in Yuma County; some controls applied. (Ariz. Coop. Sur.). NEW MEXICO - Adult counts per night in sex lure traps placed in cotton fields by county: Eddy - 54 (12 traps) June 11-13 in one field, 17 (10 traps) June 12 in one field, and 21 (10 traps) June 13 in one field (Nielsen, Eubank); southern Dona Ana - 14.5 (20 traps) June 3-13 (Adams). TEXAS - Total of 3 moths taken in light traps and 6 in sex lure traps in McLennan and Falls Counties. (Cowan et al.).

WESTERN GRAPE LEAF SKELETONIZER (Harrisina brillians) - CALIFORNIA - Eggs or adults detected locally in eradication areas in Sacramento, El Dorado, and Placer Counties; controls applied in all areas. Survey negative in Fresno, Kings, Yolo, and Solano Counties. (Cal. Coop. Rpt.).

HAWAII INSECT REPORT

Turf, Pasture - Larvae of a GRASS WEBWORM (Herpetogramma licarsisalis) spreading and causing moderate to heavy damage to turf and pasture grasses in Pepeekeo, Kohala, and Kona, Hawaii Island. Larvae per square foot up to 70 in Pepeekeo and 40 in Kohala. Heavy and scattered in Kikuyu grass pastures in Kona. Scattered infestations reappearing in Kikuyu grass pasture at Kualoa, Oahu. (Yoshioka, Au).

General Vegetables - CARMINE SPIDER MITE (Tetranychus telarius) increasing rapidly on crops and various weeds due to hot, dry weather in Waianae, Oahu; severe in some snap bean and watermelon fields. Medium to severe on weed hosts in farms and wild areas. Very light on same crops in Waimanalo and other windward areas. (Yamamoto, Sato). LEAF MINER FLIES (Liriomyza spp.) increasing on watermelon, mustard cabbage, snap beans, and tomatoes in Waianae, Oahu; heavy in some fields. Light to medium on green onions in Waimanalo and Koko Head; very light on snap beans and watermelon in Waimanalo. (Sato). SOUTHERN GARDEN LEAFHOPPER (Empoasca solana) nymphs and adults medium to heavy on yard-long beans at Koko Head and Waimanalo, Oahu. (Funasaki).

Fruits - LARGE MANGO TIP BORER (Bombotelia jocosatrix) larvae trace on mango foliage on Oahu. (Funasaki).

Ornamentals - HIBISCUS LEAF MINER (Parectopa hibiscella) larvae light to medium on hibiscus hedges at original area of infestation at Hickam Air Force Base in Honolulu, Oahu. Evident on hibiscus hedges in few other areas at base; heavy on some plants. (Takabayashi).

Forest and Shade Trees - KIAWE FLOWER LOOPER (Cosymbia serrulata) adult decrease indicated by collections in 53 light traps on Oahu. Adults averaged 0.8 per trap; highest count (12) from Waipahu. (Higa). KOU LEAFWORM (Ethmia colonella) larval damage moderate on kou (Cordia subcordata) foliage in Kailua and Kona area of Hawaii Island. (Yoshioka).

Beneficial Insects - A TACHINA FLY (Eucelatoria armigera) and a MINUTE EGG PARASITE (Trichogramma semifumatum), parasites of Herpetogramma licarsisalis (a grass webworm), dominant of beneficial species present in pastures at Hana and other areas on Maui. (Miyahira).

SURVEY METHODS

Selected References for First Half of 1967

Part VIII

Additional copies of Parts I through VIII of this bibliography are available from Survey and Detection Operations.

POPULATION MEASUREMENT

KEGG, J. D. 1967. Sampling techniques for predicting fall cankerworm defoliation. J. Econ. Ent. 60(3):889-890.

MAMPE, C. D. and NEUNZIG, H. H. 1967. The biology, parasitism, and population sampling of the plum curculio on blueberry in North Carolina. J. Econ. Ent. 60(3):807-812.

PARKER, B. L. and DRANGEID, P. E. 1967. Sampling alfalfa weevil larvae in Vermont. J. Econ. Ent. 60(1):304-305.

SHIPP, O. E. and EARHART, R. W. 1967. Comparative seasonal abundance of Heliothis larvae in cottonfields in Texas and Arkansas during summer 1964. J. Econ. Ent. 60(2):393-398.

TINKER, M. E. 1967. Measurement of Aedes aegypti populations. J. Econ. Ent. 60(3):634-637.

WIDSTROM, N. W. 1967. An evaluation of methods for measuring corn earworm injury. J. Econ. Ent. 60(3):791-794.

REARING

BLAND, R. G. 1967. Notes on rearing Melanoplus lakinus Scudder (Orthoptera: Acrididae). Pan-Pacific Ent. 43(1):23-28.

BOT, J. 1967. An artificial rearing medium for three noctuids of economic importance belonging to the genus Spodoptera (Lepidoptera). Ent. Soc. Southern Afr. J. 29:157-160.

Spodoptera exempta, S. exigua and S. ciliatum

BOT, J. and MEYER, M. K. P. 1967. An artificial rearing medium for acarid mites. Ent. Soc. Southern Afr. J. 29:199.

Rhizoglyphus echinopus and Tyrophagus sp.

BRUST, R. A. and KALPAGE, K. S. 1967. A rearing method for Aedes abserratus (F. and Y.). Mosquito News 27(1):117.

EARLE, N. W., WALKER, A. B., BURKS, M. L. and SLATTEN, B. H. 1967. Sparing of cholesterol by cholestanol in the diet of the boll weevil Anthonomus grandis (Coleoptera: Curculionidae). Ent. Soc. Amer. Ann. 60(3):599-603.

FRANKLIN, R. T. 1967. A technique for studying the insect parasites of Dendroctonus frontalis and other bark beetles (Coleoptera: Scolytidae). Ga. Ent. Soc. J. 2(2):43-44.

GIFFORD, J. R. and MANN, G. A. 1967. Biology, rearing, and a trial release of Apanteles flavipes in the Florida Everglades to control the sugarcane borer. J. Econ. Ent. 60(1):44-47.

HAGLEY, E. A. C. 1967. Artificial diet for the adult froghopper. *Nature* (London) 213(5074):414-415.

Aeneolamia varia saccharina

HALFHILL, J. E. 1967. Mass propagation of pea aphids. *J. Econ. Ent.* 60(1):298-299.

HARRIS, R. L., FRAZAR, E. D. and GROSSMAN, P. D. 1967. Artificial media for rearing larvae of horn flies. *J. Econ. Ent.* 60(3):891-892.

HARTLEY, J. C. 1967. Laboratory culture of a tettigoniid, Homorocoryphus nitidulus vicinus (Wlk.) (Orthoptera). *Bul. Ent. Res.* 57(2):203-205.

HATHAWAY, D. O. 1967. Inexpensive cardboard trays for mass rearing codling moth. *J. Econ. Ent.* 60(3):888-889.

HOUSE, H. L. 1967. Artificial diets for insects: a compilation of references with abstracts. *Res. Inst. Belleville (Canada) Inf. Bul. No. 5*, 163 pp.

HOUSER, E. C. and WINGO, C. W. 1967. Aphaereta pallipes as a parasite of the face fly in Missouri, with notes on laboratory culture and biology. *J. Econ. Ent.* 60(3):731-733.

HOWELL, J. F. 1967. Paraffin films to control dehydration of an artificial rearing medium for codling moth. *J. Econ. Ent.* 60(1):289-290.

HUNTER-JONES, P. 1967. The life-history of the eastern lubber grasshopper Romalea microptera (Beauvois), (Orthoptera; Acrididae) under laboratory conditions. *Roy. Ent. Soc. London Proc. Ser. A, Gen. Ent.* 42(1/3):18-24.

KIECKHEFER, R. W. and DERR, R. F. 1967. Rearing three species of cereal aphids on artificial diets. *J. Econ. Ent.* 60(3):663-665.

KYLE, M. L. and LONG, W. H. 1967. A simple technique for rearing Collembola in the laboratory. *J. Econ. Ent.* 60(3):882-883.

LIPPOLD, P. C. 1967. Processing of milkweed seed and notes on laboratory rearing of the large milkweed bug. *J. Econ. Ent.* 60(2):491-493.

MATSUMOTO, Y. and THORSTEINSON, A. J. 1967. A simple method for rearing the onion maggot, Hylemya antiqua Meigen (Diptera: Anthomyiidae) in the laboratory. *Appl. Ent. Zool.* 2(1):58-59.

MOORE, R. F., JR., WHISNANT, F. F. and TAFT, H. M. 1967. A laboratory diet containing egg albumin for larval and adult boll weevils. *J. Econ. Ent.* 60(1):237-241.

MYERS, A. A. 1967. The rearing of Luperina nickerlii knilli Boursin (1964) (Lep., Noctuidae) under laboratory conditions. *Entomologist* (London) 100(1244):13-15.

REDFERN, R. E. 1967. Laboratory techniques for rearing the southern armyworm. *J. Econ. Ent.* 60(1):308.

SCHMIDT, C. D., HARRIS, R. L. and HOFFMAN, R. A. 1967. Mass rearing of the horn fly, Haematobia irritans (Diptera: Muscidae), in the laboratory. *Ent. Soc. Amer. Ann.* 60(3):508-510.

SOLOMON, J. D. 1967. Rearing the carpenterworm, Prionoxystus robiniae, in the forest (Lepidoptera: Cossidae). *Ent. Soc. Amer. Ann.* 60(1):283-285.

SWAILES, G. E. 1967. A substrate for oviposition by the cabbage maggot in laboratory cultures. *J. Econ. Ent.* 60(2):619-620.

- TURNER, E. C., JR. and HAIR, J. A. 1967. Effect of diet on longevity and fecundity of laboratory-reared face flies. J. Econ. Ent. 60(3):857-860.
- TZANAKAKIS, M. E. and ECONOMOPOULOS, A. P. 1967. Two efficient larval diets for continuous rearing of the olive fruit fly. J. Econ. Ent. 60(3):660-663.
- U.S. AGRICULTURAL RESEARCH SERVICE. 1967. Mass rearing the fall armyworm in the laboratory. U.S. Agr. Res. Serv. ARS 33-117, 12 pp.
- VAIL, P. V., HENNEBERRY, T. J. and PENGALDEN, R. 1967. An artificial diet for rearing the salt marsh caterpillar, Estigmene acrea (Lepidoptera: Arctiidae), with notes on the biology of the species. Ent. Soc. Amer. Ann. 60(1):134-138.
- VANDERZANT, E. S. 1967. Rearing lygus bugs on artificial diets. J. Econ. Ent. 60(3):813-816.
- WAKELY, S. 1967. Notes on rearing Thalera fimbrialis Scop. (Lep. Geometridae). Ent. Rec. and J. Variation 79(3):73-74.
- YEARIAN, W. C. and WILKINSON, R. C. 1967. Development of three Ips bark beetles on a phloem-based rearing medium. Fla. Ent. 50(1):43-45.
- Ips avulsus, I. calligraphus, and I. grandicollis

EQUIPMENT AND TECHNIQUES

- AMOS, T. G. 1967. Apparatus for studying locomotory activity of small animals with the aid of time-lapse photography. J. Econ. Ent. 60(3):886-887.
- Carpophilus spp.
- ANDERSON, N. H. and BREMER, J. E. 1967. An efficient laboratory technique for obtaining pine bark beetle eggs and young larvae. Fla. Ent. 50(1):71-73.
- BEHIN, R. 1967. Artificial feeding apparatus for mosquitoes. Mosquito News 27(1):87-90.
- BREELAND, S. G. and GLASGOW, J. W. 1967. An improved portable resting station for Anopheles quadrimaculatus Say. Mosquito News 27(1):5-9.
- CONDRAASHOFF, S. F. 1967. An extraction method for rapid counts of insect eggs and small organisms. Canad. Ent. 99(3):300-303.
- ELLIOTT, K. R. and MULDREW, J. A. 1967. A knockdown metal cage for rearing larch sawfly larvae. Canad. Ent. 99(3):321-323.
- KISHABA, A. N., HENNEBERRY, T. J., HANCOCK, P. J. and TOBA, H. H. 1967. Laboratory technique for studying flight of cabbage looper moths and the effects of age, sex, food, and tepa on flight characteristics. J. Econ. Ent. 60(2):359-366.
- MULLER, J. 1967. A method of collecting Catocala minuta (Lepidoptera: Noctuidae) and related species. Mich. Ent. 1(4):140.
- PEACOCK, J. W., KENNEDY, B. H. and FISK, F. W. 1967. A bioassay technique for elm bark beetle feeding stimulants. Ent. Soc. Amer. Ann. 60(2):480-481.
- SAUGSTAD, E. S., BRAM, R. A. and NYQUIST, W. E. 1967. Factors influencing sweep-net sampling of alfalfa. J. Econ. Ent. 60(2):421-426.
- SELLEN, R. A. and BARKER, P. S. 1967. A technique for the collection of Tyrophagus putrescentiae eggs of uniform age. Canad. Ent. 99(1):109.

WOLF, W. W., KILLOUGH, R. A. and HARTSOCK, J. G. 1967. Small equipment for immobilizing flies with cool air. J. Econ. Ent. 60(1):303-304.

TRAPS

BANERJEE, A. C. 1967. Flight activity of the sexes of crambid moths as indicated by light-trap catches. J. Econ. Ent. 60(2):383-390.

BELTON, P. and PUCAT, A. 1967. A comparison of different lights in traps for Culicoides (Diptera: Ceratopogonidae). Canad. Ent. 99(3):267-272.

HENNEBERRY, T. J., HOWLAND, A. F. and WOLF, W. W. 1967. Recovery of released male cabbage looper moths in traps equipped with blacklight lamps and baited with virgin females. J. Econ. Ent. 60(2):532-537.

MOORE, R. L. and COOK, S. F. JR. 1967. Pan traps for migration studies of chaoborid midge larvae (Diptera: Culicidae). Ent. Soc. Amer. Ann. 60(2):478.

STEWART, P. A. and HART, E. L. 1967. Incidental capture of vertebrate wildlife in blacklight insect traps. Amer. Midland Natur. 78(1):235-240.

TASHIRO, H., HARTSOCK, J. G. and ROHWER, G. G. 1967. Development of blacklight traps for European chafer surveys. U.S. Dept. Agr. Tech. Bul. 1366, 52 pp.

Amphimallon majalis

WRIGHT, R. H. 1967. A mosquito trap. J. Econ. Ent. 60(3):876-877.

ZETTLER, F. W., LOUIE, R. and OLSON, A. M. 1967. Collections of winged aphids from black sticky traps compared with collections from bean leaves and water-pan traps. J. Econ. Ent. 60(1):242-244.

ATTRACTANTS

BEROZA, M. 1967. Nonpersistent inhibitor of the gypsy moth sex attractant in extracts of the insect. J. Econ. Ent. 60(3):875-876.

CARESTIA, R. R. and SAVAGE, L. B. 1967. Effectiveness of carbon dioxide as a mosquito attractant in the CDC miniature light trap. Mosquito News 27(1):90-92.

CASTEK,*K. L., BARBOUR, J. F. and RUDINSKY, J. A. 1967. Isolation and purification of the attractant of the striped ambrosia beetle. J. Econ. Ent. 60(3):658-660.

DAVIS, F. M. and HENDERSON, C. A. 1967. Attractiveness of virgin female moths of the southwestern corn borer. J. Econ. Ent. 60(1):279-280.

Diatraea grandiosella

HARDEE, D. D., MITCHELL, E. B. and HUDDLESTON, P.M. 1967. Procedure for bioassaying the sex attractant of the boll weevil. J. Econ. Ent. 60(1):169-171.

Anthonomus grandis

HENNEBERRY, T. J., HOWLAND, A. F. and WOLF, W. W. 1967. Combinations of blacklight and virgin females as attractants to cabbage looper moths. J. Econ. Ent. 60(1):152-156.

JACOBSON, M. and SMALLS, L. A. 1967. Sex attraction masking in the cynthia moth. J. Econ. Ent. 60(1):296.

JANTZ, O. K. and BEROZA, M. 1967. Caproic acid as an attractant for Olcella parva. J. Econ. Ent. 60(1):290-291.

JANTZ, O. K., GERTZ, R. F. and WELLS, M. T., JR. 1967. Automobile paint effective as an insect attractant. *Science* 156(3777):946-947.

OSMANI, Z. and NAIDU, M. B. 1967. Evidence of sex attractant in female Dysdercus cingulatus Fabr. *Indian J. Expt. Biol.* 5(1):51.

ROELOFS, W. L., PULVER, D. W., FENG, K. C. and GAMBRELL, F. L. 1967. Attractancy tests with chromatographed European chafer extracts. *J. Econ. Ent.* 60(3):869-870.

SMYTHE, R. V., COPPEL, H. C., LIPTON, S. H. and STRONG, F. M. 1967. Chemical studies of attractants associated with Reticulitermes flavipes and R. virginicus. *J. Econ. Ent.* 60(1):228-233.

WOOD, D. L., STARK, R. W., SILVERSTEIN, R. M. and RODIN, J. O. 1967. Unique synergistic effects produced by the principal sex attractant (compounds of Ips confusus (LeConte) (Coleoptera: Scolytidae). *Nature (London)* 215(5097):206.

PICTORIAL KEYS

TEDDERS, W. L., JR. and OSBURN, M. 1967. Separating males and females of the hickory shuck worm, Laspeyresia caryana (Lepidoptera: Olethreutidae), by sexual characters. *Ent. Soc. Amer. Ann.* 60(1):282-283.

Estimates of Damage by the European Corn Borer
To Grain Corn in the United States in 1967

Compiled in Survey and Detection Operations, PPC, ARS

The loss to grain corn attributed to the European corn borer (*Ostrinia nubilalis*) in 1967 is estimated to be approximately 59,661,000 bushels in 14 corn-producing States. In these States the loss was 1.50 percent of the production. This loss is approximately 1.26 percent of the total national crop estimated at 4,722,164,000 bushels. 1/ The value of the loss, based on the season average prices received by farmers for corn 2/, is \$63,837,000. These loss estimates are only for the States shown in Table 1, and are based on the counties or districts surveyed during the fall of 1967 within these States. 3/

Table 1 is a composite of State and Federal estimates. These estimates were prepared by using production data 1/, and prices received 2/, released by the Statistical Reporting Service. The basis for the loss estimates was determined by the survey of European corn borer populations during the fall of 1967. 3/ The index of 3 percent loss per borer per plant was used to compute the loss in bushels.

Estimated losses to grain corn for the past 16 years in States where the fall abundance survey was conducted are as follows:

1967	59,661,000 Bushels	\$ 63,837,000
1966	121,236,000 "	155,876,000
1965	54,318,100 "	59,374,160
1964	87,116,000 "	97,478,000
1963	120,648,000 "	127,838,000
1962	88,245,000 "	93,695,000
1961	65,044,000 "	68,998,000
1960	102,991,000 "	96,085,000
1959	67,763,000 "	71,979,000
1958	100,699,000 "	98,434,000
1957	180,897,000 "	158,841,000
1956	97,971,000 "	119,535,000
1955	155,355,000 "	182,579,000
1954	191,614,000 "	261,415,000
1953	90,000,000 "	125,466,000
1952	53,270,000 "	77,205,000

1/ Crop Production, 1967 Annual Summary by States, Crop Reporting Board, Statistical Reporting Service, USDA, December 19, 1967.

2/ Crop Values, Season Average Prices Received by Farmers and Value of Production-1966 and 1967 - by States, Crop Reporting Board, Statistical Reporting Service, USDA, December 19, 1967.

3/ Cooperative Economic Insect Report 18(4):42-48, 1968.

Table 1. Estimates of Damage by the European Corn Borer to Corn Grown for Grain in the United States in 1967

State	Districts Included 1/	Total State Production	Estimated Data			
			Value per Bushel	Value of Production	Loss of Crop	
	Number	1,000 Bu.	Dollars	\$1,000	1,000 Bu.	\$1,000
Arkansas	3	2,688	1.25	3,360	5	6
Delaware	1	15,403	1.18	18,176	1,256	1,483
Illinois	7	1,091,500	1.07	1,167,905	19,613	20,986
Indiana	12	447,804	1.02	456,760	4,535	4,626
Iowa	12	930,155	1.05	976,663	15,243	16,005
Kansas	3	72,080	1.09	78,567	632	689
Maryland	3	43,132	1.13	48,739	1,847	2,087
Minnesota	7	355,896	1.01	359,455	3,129	3,161
Missouri	5	198,168	1.13	223,930	4,631	5,233
Nebraska	5	329,230	1.08	355,568	4,131	4,461
North Dakota	1	4,914	1.03	5,061	138	143
Ohio	5	255,960	1.07	273,877	1,114	1,192
South Dakota	6	93,024	1.07	99,536	2,564	2,743
Wisconsin	9	136,240	1.12	152,589	823	922
Totals		3,976,194		4,220,186	59,661	63,837

1/ Cooperative Economic Insect Report 18(4):42-48, 1968

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